JUN 10 1927

JUN 8 1927

PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

Vol. LXXXIV, No. 22 JUNE 2, 1927 Per annum $4.00 Per Copy 10 Cents

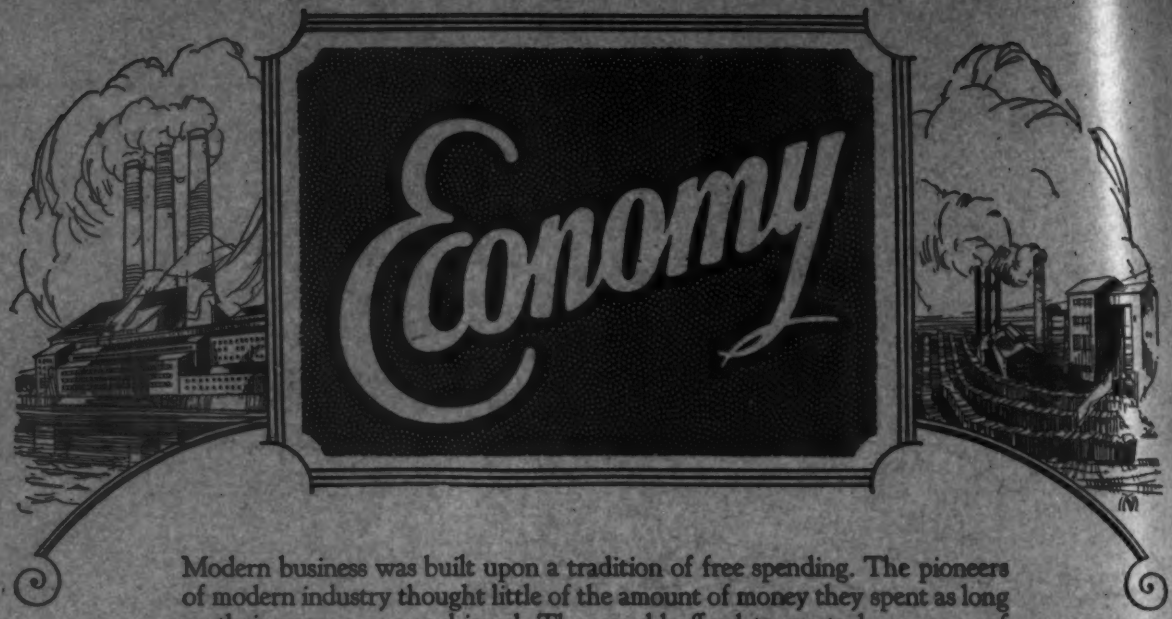
Hydro Turbine Vacuum Pumps

Built in sizes 2" to 12" for vacuums 4" to 18". Capacity range 75 to 2,200 cu. ft. per min.
Specially built for Suction Rolls, Flat Boxes, Felt Suction, Felt Clearing, etc.

Charles Walmsley & Co.
(CANADA) LIMITED

Works: Longueuil, Que.

Office: Montreal, Que.



Modern business was built upon a tradition of free spending. The pioneers of modern industry thought little of the amount of money they spent as long as their purpose was achieved. They could afford to waste huge sums of money, for they were opening up virgin territory: the profits were large and the competition was negligible.

Today, however, an entirely different condition prevails. Competition has grown, as other and more conservative business men have followed in the footsteps of the pioneers. Profits are smaller, and there is very little new territory left to open up. The business concern that achieves success nowadays must lay aside the tradition of free spending, and practise strict economy.

One of the largest factors of waste in modern industry—and a factor that is frequently overlooked—is the premature wearing out of machinery. Every machine that wears out and is discarded before it has given full service, means money thrown away. Under modern competitive conditions, no concern can afford to throw money away.

Standard Oil and Greases

prevent the premature wearing out of machinery, and reduce repair and replacement expense. By reducing friction to the minimum, they not only assure full service from every machine, but save power as well.

Standard Oils and Greases are made in grades to suit every kind of machinery now used in the industrial world. Our representative in your city is thoroughly familiar with the lubrication needs of industrial machinery, and will be glad to recommend the grades suited to your equipment.

STANDARD OIL COMPANY

(Indiana)

910 South Michigan Avenue **Chicago, Illinois**

Entered as second class matter August 13, 1925, at the Post Office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. ESTABLISHED 1872 FIFTY-FIFTH YEAR Published every Thursday by the Lockwood Trade Journal Co., at 54 N. Crystal St., E. Stroudsburg, Pa. EXECUTIVE AND EDITORIAL OFFICES: 10 EAST 39th STREET, NEW YORK CITY. CHICAGO: 123 West Madison Street, Chicago, Ill.

For Efficiency in Paper Coloring

THE attention of paper makers is directed to the wide range of National Direct Yellows. Where brightness is essential National Erie Yellow S2GP Conc. is especially recommended.

Samples and full technical information from all National Branches.

National Aniline & Chemical Co., Inc.
40 Rector St., New York, N.Y.

BOSTON PHILADELPHIA SAN FRANCISCO
PROVIDENCE CHICAGO MONTREAL
HARTFORD CHARLOTTE TORONTO

NATIONAL DYES

NATIONAL N DYES

PAPER TRADE JOURNAL

ESTABLISHED 1872

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

FIFTY-FIFTH YEAR

Published Every Thursday by the

LOCKWOOD TRADE JOURNAL CO., Inc.

LESLIE R. PALMER, President — GEO. S. MACDONALD, Vice-President & Treas. — F. K. HOPPIE, Secretary

Executive and Editorial Offices: 10 East 39th Street, New York
Chicago Office: Room 14, Suite 410, 123 West Madison St.

TABLE OF CONTENTS

Copyright 1927 by Lockwood Trade Journal Co., Inc.

Superintendents Meet in Richmond 31
Paper Demand Sluggish in Chicago 42
Good Progress on New Quebec Paper Mill 44
Indianapolis Paper Can Co. Formed 44
News Print Issue Before Canadian Courts 46
Fox River Valley Safety Program 48
Paper Demand Slower in Philadelphia 50
New Officers of National Paper Box Association ... 50
Couthorne Paper Co. Holds Outing 52
Hammermill Agents at Regional Meeting 52
D. Lindsay Evans Joins Paper House 52
Committee on Statistics Meets 54
Changes at White & Wyckoff Plant 58
Brotherhood Arranging Wages 58
Boston Paper Market Steady 58
Committees of A. P. & P. A. 60
New York Trade Jottings 64
Editorial **66**
Paper Census Changes Recommended 67
Good Progress on I. P. Mill at Camden 67
Northwestern Pulp Co. Tenders Bond 67
First Unit in Farmers Power House Starts 67

Technical Section

The K-B Process 69
Universal Hydraulic Variable Speed Gear 71
Waste LiquorUtilization 77
Powdered Fuel Combustion 81
Papermachine Operation and Stock Hydration . 83
Harvey-Lewellen Caliper Control 85
Rod Mill in Preparation of Wood Pulp 86
Ground Wood Pulp 87
Avoid Waste in Making Ground Wood 88
Bleached Sulphite Versus Sulphate Pulp 89
CO_2 Recorders 90
An American Paper Coating Clay 91

Construction News 96
Imports of Paper and Paper Stock 98
New York Market Review **102**
Miscellaneous Markets **104**
Market Quotations **106**

The PAPER TRADE JOURNAL is indexed in Industrial Arts Index

Want and For Sale Advertisements 113, 114, 115, 116, 117

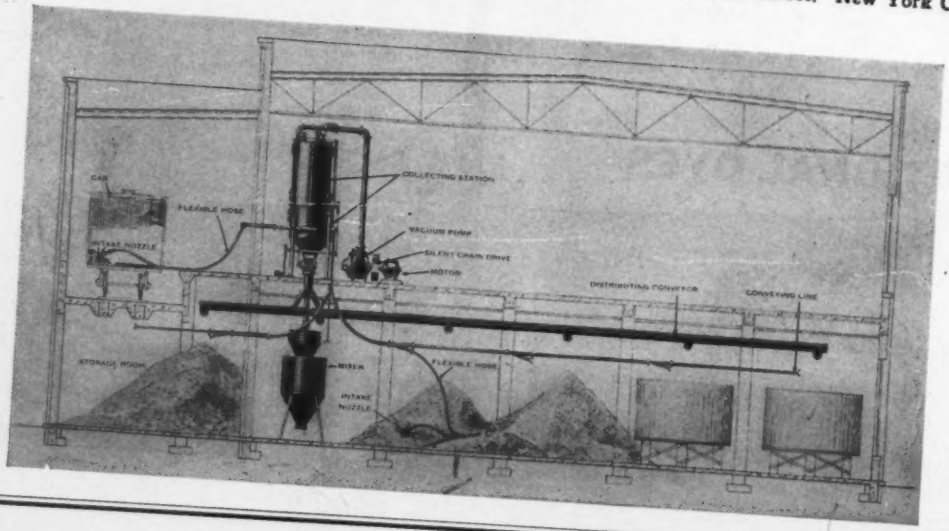
R. T. VANDERBILT CO. N.Y. McNAMEE CLAY AMERICAN PRODUCTS

McNAMEE CLAY

ANALYSIS

Moisture	.80%
Combined Water	13.74%
Silica and Insoluble	44.81%
Oxide of Iron	.17%
Oxide of Aluminum	40.06%
Magnesium Oxide	.42%
	100.00
Grit	.15%

R. T. VANDERBILT COMPANY
50 East 42nd Street. New York City, N. Y.



ESTABLISHED IN 1872

PAPER TRADE JOURNAL

With Which Is Combined

PAPER

The Magazine of the Paper Industry

Vol. LXXXIV, No. 22 Thursday, June 2, 1927

Paper Mill Superintendents Meet in Richmond

Eighth Annual Convention of American Pulp and Paper Mills Superintendents Association Attracts Record Attendance of Officials From Every Section of Country—Problems of Vital Interest to the Members Are Freely Discussed and Are the Subject of Many Excellent Papers—F. J. Rooney Re-Elected President of Organization for Coming Year

[FROM OUR SPECIAL REPRESENTATIVE]

RICHMOND, Va., May 28, 1927.—"Howdy, Paper Makers, Glad You Are Here," was the salutation emblazoned on surface cars and public utility buses which greeted the delegates and members of the American Pulp and Paper Mill Superintendents Association as they arrived here to attend the Eighth Annual Convention of the Association which opened at the Hotel Jefferson on Thursday last.

A Real Dixie Welcome

Never before in the history of any association connected with any branch of the pulp and paper industry has such public recognition been accorded as was given to the Superintendents Association which closed at noon today, the most successful convention of its career.

Ten years ago it seemed inconceivable that an organized body could be welded together, composed of pulp and paper mill superintendents who would assemble in annual conference for the purpose of exchanging their views and opinions relative to the solving of problems which confronted them daily in their respective mills. Those of pessimistic minds said "it could never be accomplished."

Rapid Growth of Organization

Within the short space of time, eight years, not only has this been accomplished but an association has been created which today commands the attention and respect of the entire industry of which it is now recognized as an integral part. Its founders may well be proud of the infant they nourished, despite the adverse situation which confronted them at its birth, through these eight years with their faith that all things were not beyond accomplishment.

They climaxed their efforts in the convention just closed which was the largest attended of any yet held and notable for the number of exceptionally fine papers read during the several daily sessions and which were liberally discussed at each hearing.

Convention Opens Promptly

The opening of the convention Thursday morning on schedule indicated that "promptness" was to be the motto of the daily sessions and it was featured throughout all the meetings and proved an inspiration for largely attended and interesting sessions. The opening remarks by Carl Magnus, chairman of the convention committee, indicated the cordial greeting which the members found awaiting them on every hand.

After the invocation by the Rev. S. B. Cousins, of the Second Baptist Church of Richmond, the address of welcome on behalf of the city was given by R. Keith Compton, Director of Public Works, who gave an interesting recital of the history of the city and its immediate surroundings.

William T. Dabney, manager of the Chamber of Commerce, in further extending the welcome of the city injected a lively spirit which set an example that was followed throughout the entire sessions.

Response to the welcome of the city officials was made by Benjamin T. Larrabee, first vice president of the association.

The President's Message

President Fred J. Rooney, in his annual message, covered the progress made by the association during the past year. He emphasized on the results to be obtained through membership in the association by the exchange of ideas, discussions, experiences and solutions of manufacturing problems. He drew attention to the advantages being obtained by the holding of monthly meetings of the various sectional divisions.

Important Addresses Enjoyed

The morning business sessions started with an address by R. B. Robertson, president of the Champion Fibre Company, of Canton, N. C., who spoke of the necessity of team work in producing successful results in any line of business effort.

This was followed by papers on "Forestry in the Paper Industry," by D. C. Crocker, "Purity Factors in Wood Pulp and Their Relation to Paper," by N. L. Nourse, of the Brown Company of Portland, Maine, and "The A. B. Wood Patent Centrifugal Pump for Paper Stock," by M. D. McNellie, manager of the Three Rivers, Michigan, plant of the Fairbanks Morse Company.

Thursday afternoon was devoted to Divisional meetings, covering the subjects of chemical and mechanical pulps, books and fine writings, board and coarse papers, during which the following papers were read:—

Tendencies of Waste Elimination—Edward Eyre Hunt, Department of Commerce.

Avoiding Waste in the Manufacture of Ground Wood—Levi A. Fralick.

Hard Wood—Its Use in the Sulphite Process—Wesley M. Osborne.

The Recovery of Waste Sulphite Liquor—W. E. Byron Baker.

Some Phases of Ground Wood Manufacture—Geo. K. Walker.

Continuous Causticizing in Soda and Sulphate—C. L. Knowles.

Use of Bleached Sulphate versus Sulphite—H. A. Helder, Champion Fibre Company.

Use of Glue in the Beater—Geo. K. Hamill, Research Associate American Glue Research Association.

Developments in American Clays—E. T. Edgar, Miner-Edgar Company.

Refining of Rosin for Sizing High Grade Paper—C. E. Mueller, Paper Makers Chemical Company.

Printers' Troubles with Fine Papers—James J. Fulton.

K-B Process of Waterproofing—H. C. Avery, Flint Kote Company.

The Harvey-Lewellen Control Device—Tom Harvey, Gardner-Harvey Company.

How To Test Sulphite Pulp for Folding Qualities—Sidney Wells.

What Technical Control and Good Engineering Is Doing for the Tissue Paper Business—J. E. Blosser, Scott Tissue Company.

Some Recent Developments in Paper Mill Drive—C. W. Drake, Westinghouse Electric and Manufacturing Company.

Annual Banquet

The Annual Banquet, which opens the social features of the conventions, was held in the auditorium of the Jefferson Hotel on Thursday evening, and was an event which will remain long in the memory of those attending. The toastmaster was General Jo Lane Stern and the guest speaker Dr. D. W. Daniel, of Clewson College, Clewson, North Carolina, whose "Humorous Talk" kept his audience in raptures.

A Refreshing Performance

"An Evening in Old Virginia," a playlet given by Ruby Vaughn Bigger & Co., the characters in which depicted the girlhood days of Lady Astor (the former Miss Nancy Langhorne of Virginia), as described by her old "Mammy Veenie."

It gave an accurate picture of the old Virginia Negro "Mammy," a rapidly vanishing type of former slaves so adored by the passing generation of Virginians. It was a most refreshing and enjoyable performance, appealing to the finer sensibilities and climaxed an evening of enjoyment which set a mark for future banquets to surpass.

Friday Morning's Session

The Friday morning session opened with a one-half hour period allotted to the reading and discussion of each of the papers delivered and this schedule was closely adhere to. Among the papers read were:—

"Is the Training of Workers by Means of Educational Classes Worth While?"—J. Norman Spawn, Educational Director Champion Fibre Company, Canton, N. C.

Making Paper White—August Merz, The Heller & Merz Company, New York.

The Degree of Hydration—Harry Williamson, Champion Fibre Company, Canton, N. C.

Some Considerations of, and the Furnace Design for, Powdered Fuel—T. A. McGee, Advisory and Combustion Engineer, Furnace Engineering Company, New York.

Safety as a Production Factor in Paper Making—W. J. Peacock, Chairman Pulp and Paper Section, National Safety Council.

Local Plants Inspected

Yesterday afternoon (Friday) was given to visiting the plant of the Standard Paper Manufacturing Company, the Albemarle Paper Manufacturing Company, the Bedford Pulp and Paper Company, the Larus Bros. Tobacco Company, and others.

The visiting ladies, under the guidance of Dr. Douglas S. Freeman, editor of the *Richmond News Leader*, visited the historical spots of the city, among them the State Capitol, where is located the original statue of George Washington.

Last evening was the men's night, the banquet and entertain-

PICTURE TAKEN AT THE ANNUAL CONVENTION OF THE AMERICA

ment being exclusively for them, while the ladies were just as exclusive, having their own affair in another dining hall.

A Clever Stunt

The men's affair was featured by a brawl between what seemingly appeared to be a head waiter and a guest at one of the tables. The seeming head waiter during the serving of the courses by his arrogance had incurred the displeasure of nearly every one present.

As the last course was served he and the guest were immediately locked in a struggle, its realism being intensified with the arrival of several members of the local police who undertook to separate the combatants. Accomplishing this the supposed disturbers decided to settle the dispute with a boxing match on the stage. The comedy of this soon convinced the serious minded they had witnessed as clever a piece of vaudeville as was ever presented.

The Closing Day's Sessions

The sessions of the closing day were confined to the morning hours and opened with a paper by E. F. Stemmler, of Allis Chalmers Company, of Milwaukee on the "Use of Rod Mills" which was followed by papers on:

Reducing the Stack Loss—M. F. Corin, Permutit Company, New York.

"The Youngchild Wire Cleaner"—F. K. Becker, Bird Machine Company, South Walpole, Mass.

The Laughlin Centrifugal Washer—M. D. McNellie.

Waterbury Hydraulic Variable Speed Control—D. R. Francis, Waterbury Tool Company, Waterbury, Conn.

Modern Methods of Water Purification—M. F. Corin, Permutit Company, New York.

Officers Elected for Coming Year

The following were elected officers for the ensuing year:—

President, Fred J. Rooney, of the Upson Company, Lockport, N. Y.

First Vice President, B. T. Larrabee, of S. D. Warren Company, Cumberland Mills, Maine.

Second Vice President, James G. Ramsey, of the Cherry River Paper Company, Richmond, W. V.

Third Vice President, Carl Magnus, of Standard Paper Manufacturing Company, Richmond, Va.

Fourth Vice President, Geo. H. Pountain of Allied Paper Mills, Kalamazoo, Mich.

Fifth Vice President, Charles N. Mooney, of Smith Paper Company, Lee, Mass.

Robert L. Eminger of Miamisburg, Ohio, was re-elected secretary and Peter J. Massey, of the Hall Printing Company, of Chicago, was elected treasurer.

Forestry Policy Endorsed

A resolution was passed endorsing the forestry policy as outlined in the talk given by D. C. Crocker, secretary of the Woodlands Division of the American Paper and Pulp Association.

A resolution extending the gratitude of the association to Carl Magnus, chairman of the convention committee, his associates on the committee, the paper mills of Richmond, and the allied industries of Richmond for the cordial reception and cooperation given those attending the convention, was also passed.

At the close of the session today, President Rooney, as a testimonial for his untiring efforts on behalf of the association, was presented with a complete set of Educational Text Books which were published by the Vocational and Educational Committee of the Paper and Pulp Association of United States and Canada.

Amongst Those Who Attended

Among the 450 members and delegates attending the convention were the following:—

Emerson Ahles, Wausaw Sulphate Fibre Company, Mosinee, Wis.; A. J. Allison, Miami Division West Carrollton, West Carrollton, Ohio; Michael J. Argy, Cliff Paper Company, Niagara

PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, RICHMOND, VA., MAY 26-28, 1927

FRED J. ROONEY, PRES.

B. T. LAKRABEE, 1ST VICE PRES.

J. G. RAMSEY, 2ND VICE PRES.

Falls, N. Y.; A. P. Atkinson, Wm. E. Hooper Sons Company, Philadelphia; A. Anable, The Dorr Company, New York, N. Y.; H. E. Atkinson, Public Printers Offices, Richmond, Va.; H. C. Avery, Flint-Kote Company, New York, N. Y.

Dr. H. P. Baker, American Pulp and Paper Association, New York, N. Y.; W. E. Baker, Continental Paper and Bag Company, New York City, N. Y.; J. E. Blosser, Scott Tissue Company, Chester, Pa.; F. E. Brown, Manchester Board and Paper Company, Richmond, Va.; T. J. Bannister, Standard Paper Manufacturing Company, Richmond, Va.; C. L. Boyd, Standard Paper Manufacturing Company, Richmond, Va.; H. Bennett, Valley Iron Works, Appleton, Wis.; L. M. Booth, Booth Chemical Company, Elizabeth, N. J.; B. M. Briggs, Lawrence Paper Manufacturing Company, Lawrence, Kan.; H. O. Bing, Paper and Textile Machine Company; P. S. Belton, E. K. Mansfield Company, New York, N. Y.; Francis E. Bentley, Noble and Wood Machine Company, Hoosick Falls, N. Y.; G. S. Brasen, Appleton Machine Company, Appleton, Wis.; R. N. Bechard, Eastwood Wire Manufacturing Company, Belleville, N. J.; W. E. Blauvelt, Cameron Machine Company, Brooklyn, N. Y.; George F. Begnal, Baker Manufacturing Company, Saratoga Springs, N. Y.; W. H. Burton, Philadelphia Quartz Company, Philadelphia, Pa.; R. A. Burroughs, R. A. Burroughs and Company, Norfolk, Va.; E. B. Barrett, Mead Sales Company, Dayton, O.; Frank Ball, Manhattan Rubber Company, Passaic, N. J.; L. S. Barker, Downingtown Manufacturing Company, Downingtown, Pa.; F. K. Becker, Bird Machine Company, S. Walpole, Mass.; C. L. Bennett, J. J. McCabe Lathe and Machine Company, New York, N. Y.; A. E. Bridge, Shartle Bros. Machine Company, Middltown, O.; A. F. Brunell, Paper Makers Chemical Company, Holyoke, Mass.; C. R. Buck, Buck Kaier Company, New York, N. Y.; K. Y. Burckhalter, Kalbfleisch Corporation, New York, N. Y.; W. H. Burns, Valley Iron Works, Appleton, Wis.; C. J. Baker, Bedford Pulp and Paper Company, Big Island, Va.; Francis L. Barstow, 80 Atlantic avenue, Fitchburg, Mass.; A. L. Beals, Newark, Del.; F. N. Beveridge, Hummel Ross Fibre Corporation, Hopewell, Va.; Geo. L. Bidwell, Warren Manufacturing Company, Riegelsville, Pa.; John Bingham, Dill and Collins Company, Frankford, Philadelphia, Pa.; Benjamin Bishop, Sonoco Products Company, Hartsville, S. C.; Geo. Bonner, Falls Manufacturing Company, Oconto Falls, Wis.; John A. Bowers, Hammermill Paper Company, Erie, Pa.; P. C. Boyce, Wausau Paper Mills Company, Brokaw, Wis.; L. H. Breyfogle, 319 W. Walnut street, Kalamazoo, Mich.; A. W. Bronk, Moore and Thompson Paper Company, Bellows Falls, Vt.; Martin V. Brooks, Miamisburg Paper Company, Miamisburg, O.; Wm. S. Brooks, Champion Fibre Company, Canton, N. C.; J. H. Braugham, Foster Box Board Company, Utica, N. Y.; Wm. Brydges, 763 8th street, Niagara Falls, N. Y.; W. J. Burns, Sonoco Products Company, Hartsville, S. C.; E. W. Bush, Crocker-Mc-

CARL MAGNUS, 3RD VICE PRES.

G. H. POUNTAIN, 4TH VICE PRES.

C. N. MOONEY, 5TH VICE PRES.

Why do you buy smooth rolls?

BIRD MACHINERY

Why do you pay good money for accurate, careful machine finishing on your roll surfaces?

Because you can get better paper at lower cost than you could with rough, unfinished rolls. Isn't that so?

Alert paper makers are equipping their rolls with Vickery Doctors for the same reason.

Vickery Doctors keep every inch of every roll as clean and smooth as the day it started up.

If you believe clean, smooth rolls are worth having and *keeping* you need them equipped with Vickery Doctors.

Use Vickery Doctors on your

Breast Rolls
Wire Rolls
Press Rolls
Smoothing Rolls
Dryers
Yankee or M. G. Dryers
Calender Rolls
Super Calender Rolls
Sizing Rolls
Coating Rolls
Cooling Rolls

The **Vickery Doctor**

BIRD MACHINE COMPANY
SOUTH WALPOLE MASSACHUSETTS

891

Elwin Company, Holyoke, Mass.; Ed. Butterfield, Gardner Harvey Paper Company, Middletown, O.; J. F. Bonardi Mine and Smelter Supply Company, New York, N. Y.; W. M. Bensing, Champion Fibre Company, Canton, N. C.; F. E. Brown, Manchester Board and Paper Company, Richmond, Va.

John Calder, Wrenn Paper Company, Middletown, O.; Chas. E. Conley, 4 W. Main street, Norwich, Conn.; W. H. Croft, Esleeck Manufacturing Company, Turners Falls, Mass.; Lester W. Crouse, 75 Chestnut street, Bogota, N. J.; Wallie H. Cunningham, Mead Pulp and Paper Company, Dayton, O.; John Cornell, The Paper Mill, New York, N. Y.; W. Carmody, Tennessee Paper Mills, Chattanooga, Tenn.; A. B. Clark, J. O. Ross Engineering Company, New York, N. Y.; Chris. C. Crusius, American Voith Contact Company, New York, N. Y.; Samuel Clayman, National Aniline and Chemical Company, Philadelphia, Pa.; Jas. F. Collins, Bogota Paper Board Company, Bogota, N. J.; Col. R. E. Compton, City Hall Road, Va.; M. F. Corin, Permutit Company, New York, N. Y.; D. A. Crocker, American Paper and Pulp Association, New York, N. Y.; T. L. Crossley, Associate Editor, *Pulp and Paper Magazine of Canada*, Gardenvale, Canada; W. P. Carter, Standard Paper Manufacturing Company, Richmond, Va.; E. C. Cole, Standard Paper Manufacturing Company, Richmond, Va.

Edwin J. Dewey, Whitmer-Parsons Pulp and Lumber Company, Philadelphia, Pa.; Jos. H. Dow, Eastwood Wire Manufacturing Company, Belleville, N. J.; J. Donaldson, Scandinavian Pulp Agency, New York, N. Y.; Robert Douglas, Ohio Knife Company, Cincinnati, O.; F. W. Drake, Lockport Felt Company, Newfane, N. Y.; William Dickinson, Algonquin Paper Corporation, Ogdensburg, N. Y.; Frank Dittmire, Gardner Harvey Paper Company, Middletown, O.; T. L. Dunbar, Stebbins Engineering Company,

P. J. MASSEY, TREAS.

Watertown, N. Y.; Edward F. Driscoll, Smith Paper Company, Lee, Mass.; Arthur B. C. Drew, The Fairpoint Corporation, New Bedford, Mass.; Harry W. Deffew, Standard Paper Company, Richmond, Va.; W. T. Dabney, Richmond Chamber of Commerce, Richmond, Va.; H. S. Donald, Standard Paper Manufacturing Company, Richmond, Va.; Franklin Dorset, Richmond, Va.; C. W. Drake, Westinghouse Electric and Manufacturing Company, Schenectady, N. Y.; C. S. Dansey, Standard Paper Manufacturing Company, Richmond, Va.; John R. Diggs, Albemarle Paper Manufacturing Company, Richmond, Va.

Elmer N. East, Michigan Paper Company, Plainwell, Mich.; Ivar Ekholm, National Aniline and Chemical Company, New York, N. Y.; Charles L. Ellis, Downingtown Manufacturing Company, Downingtown, Pa.; R. L. Eminger, 54 North Main street, Miamisburg, O.; Vance P. Edwards, Forest Products Laboratory, Madison, Wis.; J. P. Ekberg, Chesapeake Corporation, West Point, Va.; C. M. Eshelman, Cameron Machine Company, Brooklyn, N. Y.; Frank Egan, John Waldrow Corporation, New Brunswick, N. J.; T. L. Edmonds, Warsaw Paper Mills Company, Brokaw, Wis.; J. C. Ellison, General Dyestuff Corporation, Philadelphia, Pa.; H. T. Edgar, Miner-Edgar Co., New York, N. Y.; H. W. Ellerson, Albemarle Paper Manufacturing Company, Richmond, Va.

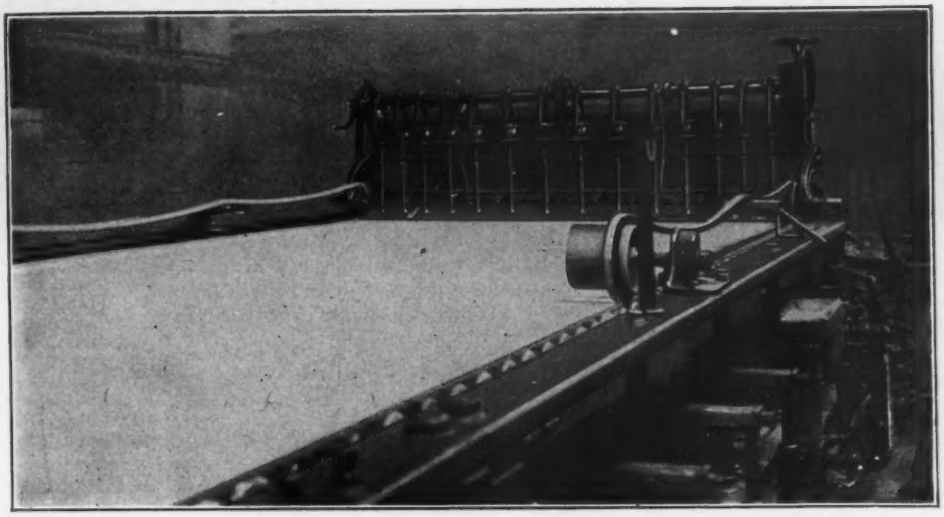
D. R. Francis, Waterbury Tool Company, Waterbury, Conn.; Jas. F. Fulton, Baltimore, Md.; A. C. Ford, A. A. Simonds

R. L. EMINGER, SEC.

Dayton Company, Dayton, O.; James Foxgrover, Eastern Paper Makers Chemical Company, Kalamazoo, Mich.; H. D. Frost, W. S. Tyler Company, Cleveland, O.; S. J. Fortune, Rochester Paper Company, Rochester, Mich.; Geo. F. Forman, Schmidt and Ault Paper Company, York, Pa.; Spottswood C. Foster, Bedford Pulp and Paper Company, Colemans Falls, Va.; Levi A. Fralick, Algonquin Paper Company, Ogdensburg, N. Y.; H. W. French, Hammermill Paper Company, Erie, Pa.; Harlow G. Funsett, Hagar Straw Board and Paper Company, Cedarville, O.

Edwin H. Gibbons, The Smith Paper Company, Lee, Mass.; E. C. Gildensopf, Congoleum Nairn, Inc., Asbestos, Md.; Walter D. Gould, H. N. Hill and Company, Philadelphia, Pa.; M. J. Guild, Havana, Cuba; W. A. Gocko, Griley-Unkle Engineering Company, Fort Wayne, Ind.; W. L. Glass, B. F. Goodrich Rubber Company, Akron, O.; W. W. Galoway, Hagar Strawboard Company, Cedarville, O.; W. Greeley, F. C. Huyck and Sons, Albany, N. Y.; J. C. Gayler, S.K.F. Industries, Inc., New York, N. Y.; Harry W. Griffin, Taylor Stiles and Company, Riegelsville, N. J.; R. M. Guye, Philadelphia Felt Company, Philadelphia, Pa.; A. C. Goolsby, A. C. Goolsby Paper Company, Richmond, Va.; Marx Gunst, American Paper Company, Richmond, Va.

A. D. Harvey, Nash Engineering Company, So. Norwalk, Conn.; W. M. Hannum, The Richard L. Cawood Company, E. Liverpool, O.; H. R. Harrigan, District of Columbia Paper Company, Washington, D. C.; J. R. Hartman, Union Gas and Electric Company, Cincinnati, O.; H. D. Harton, Simonds Saw and Steel Company, Fitchburg, Mass.; F. R. Henry, A. A. Simonds-Dayton Company, Dayton, O.; Raymond Himes, Manhattan Rubber Mfg. Co., Passaic, N. J.; Everett F. Howarth, Simonds Saw and Steel Company, Fitchburg, Mass.; Allen Hyer, Black Clawson and Company, Hamilton, O.; J. L. Hayes, Bemiss Brothers Building Company, Peoria, Ill.; R. W. Harrock, Escanaba Paper Company, Escanaba, Mich.; John A. Harlow, Penobscot Chemical Fibre Company, Great Works, Me.; Tom Harvey, Gardner Harvey Company, Middletown, O.; John Hercher, John Strange Paper Company, Menasha, Wis.; Adolph Hess, Fibre Conditioning Company, Richmond, Ind.; F. E. Hummel, Hummel Ross Ribre Corporation, Hopewell, Va.; Dr. Henry, Simonds Knife Company, Dayton, O.;



Faster Machines.... Faulty Paper Invest in a Voith Inlet

Faster machines . . . another change in modern paper making. In many cases old machines are producing 25% more paper than the former capacities called for. New machines for practically all types of paper are now built to operate at comparatively higher speeds. The modern high speed news machine is an excellent example of this gradual trend towards mass production. Machines producing book, bond, kraft, etc., are no exceptions to this change in paper making.

Mass production demands improved stock control methods for feeding the stock to the wire lest an attempted increase in production brings a corresponding decrease in quality. A distinct advance is found in the Voith Stock Inlet method for making quality paper on a quantity basis. Two hundred Voith Inlets now in service uphold this statement. Let us show you why users consider the Voith Inlet an investment rather than a purchase. We will also send you a booklet giving full information about this machine. Write today.

VALLEY IRON WORKS CO.

APPLETON, WISCONSIN

New York Office: 350 Madison Avenue

Western Manufacturing
Smith & Valley
Portland

Sales Division
Iron Works Co.,
Oregon

H. F. Hoffman, 729 60th street, W. Philadelphia, Pa.; Reginald Hunter, Standard Paper Mfg. Co., Richmond, Va.; E. P. Hall, Standard Paper Manufacturing Company, Richmond, Va.; Geo. K. Hamill, American Glue Association, Washington, D. C.; H. A. Helder, Champion Fibre Company, Canton, N. C.; A. Hoen, Richmond, Va.; A. S. Hooper, Richmond, Va.; J. P. Hummell, Hummell-Ross Fibre Corporation, Hopewell, Va.; Gosta Hall, Albemarle Paper Manufacturing Company, Richmond, Va.

T. H. Ireland, The Crane Company, Chicago, Ill.; J. A. Inge, Albemarle Paper Manufacturing Company, Richmond, Va.

H. H. Jensenius, Daniel Hicks, New York, N. Y.; S. W. Jacobs, Electro Bleaching Gas Company, New York, N. Y.; C. H. R. Johnson, Beckett Paper Company, Hamilton, O.; N. W. Johnson, Chesapeake Corporation, West Point, Va.

Thos. J. Keenan, *The Paper Industry*, New York, N. Y.; R. H. Kelly, Marathon Paper Mills, Rothschild, Wis.; C. H. Kent, Kalbfleisch Corporation, Waterbury, Conn.; L. F. Knickerbocker, Provincial Paper Mills, Ltd., Port Arthur, Ont., Canada; Robert Knowles, Reading Paper Mills, Reading, Pa.; Kenneth T. King, 1114 Tribune Building, Chicago, Ill.; J. A. Kellogg, Jr., Mead Patton Company, New York, N. Y.; Harry C. Kinnie, Bagley and Sewell, Watertown, N. Y.; C. J. Kern, Moore and White Company, Philadelphia, Pa.; A. J. Kennedy, Sandy Hill Iron and Brass Works, Hudson Falls, N. Y.; Robert F. Kohs, Detroit Sulphite Paper Company, Detroit, Mich.; Edward Korman, Heller and Merz Company, Chicago.

Benj. T. Larrabee, S. D. Warren Company, Cumberland Mills, Md.; H. Homer Latimar, Beckett Paper Company, Hamilton, O.; Willard T. Libby, Brown Company, Berlin, N. H.; W. J. Livingston, Dexter Sulphite Pulp and Paper Company, Dexter, N. Y.; T. Lof, Hummel Ross Fibre Corporation, Hopewell, Va.; A. J. Loman, Robert Gair Company, New London, Conn.; Chas. J. Ludwig, Mead Pulp and Paper Company, Chillicothe, O.; Fritz Lueders, Siebold Machine Company, Dayton, O.; Herbert Lippitt, International Paper Company, New York, N. Y.; O. E. Larson, Homan Manufacturing Company, Lancaster, O.

A. A. Mintle, Va. Bag Company of America, Oakmont, Pa.; H. E. Maul, Ravenswood Paper Company, Long Island, N. Y.; Louis C. Marburg, Marburg Brothers, Inc., New York, N. Y.; W. W. Maclan, Black Clawson Company, Hamilton, O.; C. E. Mueller, Western Paper Makers Chemical Company, Kalamazoo, Mich.; T. H. Morrissey, Shuler Benninghofen, Hamilton, O.; John A. Murray, Wm. A. Hardy and Sons Company, Fitchburg, Mass.; C. E. Macklem, Beloit Iron Works, Beloit, Wis.; Ralph K. McCluskey, H. T. McCluskey and Sons; J. G. Mason, Jr., The Miner Edgar Company, New York City, N. Y.; Jas. M. Mackin, R. C. Atkins and Company, Indianapolis, Ind.; H. C. Mayhew, S. M. Langston Company; William MacGregor, Bemis Brothers Bag Company, Peoria, Ill.; J. E. Madero, Cherry River Paper Company, Richwood, W. Va.; E. K. Mansfield, Muirhead and Mansfield, New York, N. Y.; Peter J. Massey, W. F. Hall Printing Company, Chicago, Ill.; J. F. McKenzie, Don Valley Paper Company, Ltd., Toronto, Ont., Canada; Edward McWhirter, Provincial Paper Mills, Georgetown, Ont.; C. N. Mooney, Smith Paper Company, Lee, Mass.; Frank J. Mooney, Smith Paper Company, Lee, Mass.; Wm. C. Mooney, "In School," "Spec," New York, N. Y.; F. J. Morrison, Hummel Ross Fibre Corporation, Hopewell, Va.; J. M. Murray, Bogalusa Paper Company, Bogalusa, La.; Lester S. McCurdy, P. O. Box 1011, Bradentown, Fla.; O. J. Mills, Sandy Hill Iron and Brass Works, Hudson Falls, N. Y.; D. H. Montville, Shartle Brothers Machine Company, Middletown, O.; C. H. Morgan, Lockport Felt Company, Newfain, N. Y.; W. H. Munson, Forest Products Laboratories, Madison, Wis.; Carl Magnus, Standard Paper Manufacturing Company, Richmond, Va.; I. J. Marcuse, Bedford Pulp and Paper Company, Richmond, Va.; M. E. Marcuse, Bedford Pulp and Paper Company, Richmond, Va.; T. B. McDowell, 2526 Hanover avenue, Richmond, Va.; T. A. McGee, Furnace Engineering Company, New York, N. Y.; M. D. McNellie, Three Rivers Plant, Three Rivers, Mich.; August Merz, Heller and Merz Company, New York, N. Y.; A. J. Monroe, Reporter; Jas. P. Massie, Albemarle Paper Manufacturing Company, Richmond, Va.; Louis Miller, Albemarle Paper Manufacturing Company, Richmond, Va.

C. H. Noble, A. E. Staley Manufacturing Company, Kalamazoo, Mich.; S. J. Naughtrip, Toronto Paper Manufacturing Company, Toronto, O.; L. D. Nicholson, District of Columbia Paper Company, Washington, D. C.; H. H. Noblett, Standard Paper Manufacturing Company, Richmond, Va.; Chas. F. North, Green Bay Foundry and Machinery Works, Green Bay, Wis.; A. G. Natwick, Lincoln Pulp and Paper Company, Merritton, Ont.; Robert B Nixon, E. C. Atkins and Company, Indianapolis, Ind.; J. H. Noble, The Oliver Filter Company, New York; N. L. Nourse, Brown Company, Berlin, N. H.; E. R. Neblett, Standard Paper Manufacturing Company, Richmond, Va.

Harry C. O'Neill, Oswego Falls Corporation, Skaneateles, N. Y.; Neth Owen, Buck Hill, So. Richmond, Va.; J. W. Outerson, Paterson Parchment Paper Company, Modena, Pa.; John Owens, Jr., Fibre Conduit Company, Orangeburg, N. Y.; J. J. O'Brien, Boston, Mass., Spec.; Ellis Ollson, Chesapeake Corporation, West Point, Va.

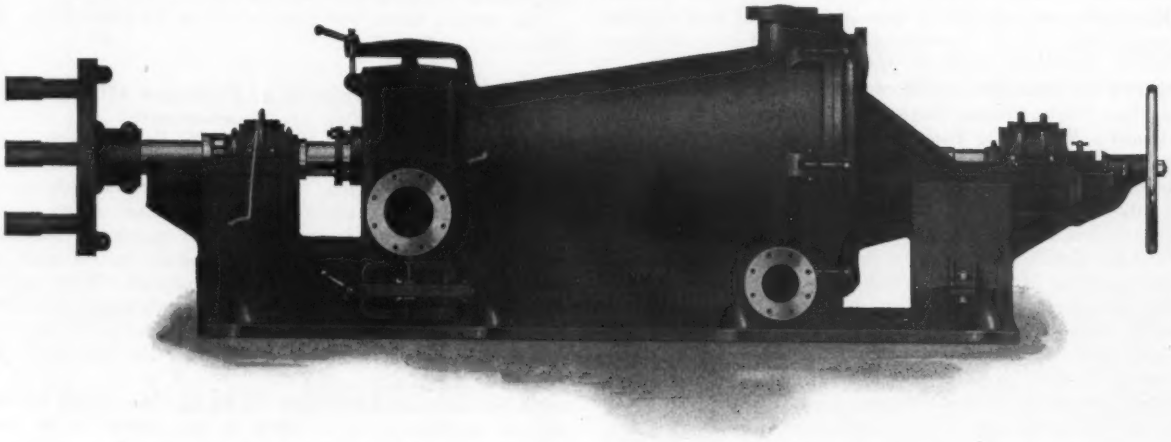
W. J. Peacock, Green Bay, Wis.; L. D. Post, New York, N. Y.; Fred H. Powell, Schwartzchild Brothers, Richmond, Va.; Jas. E. Powers, Chesapeake and Ohio Railroad Offices, Richmond, Va.; Ordway Puller, American National Bank, Richmond, Va.; R. H. Palmore, Albemarle Paper Manufacturing Company, Richmond, Va.; L. E. Preble, Standard Paper Manufacturing Company, Richmond, Va.; Walter E. Packard, Hammermill Paper Company, Erie, Pa.; Geo. V. Parmeter, Tomahawk-Kraft Paper Company, Tomahawk, Wis.; Jacob Parent, Western Board and Paper Company, Kalamazoo, Mich.; Ross Puette, Manchester Board and Paper Company, Richmond, Va.; Jos. E. Plumstead, 716 Greenhill avenue, Wilmington, Del.; E. M. Potter, S.K.F. Industries, Charlotte, N. C.; Max Poyck, The Heller & Merz Company, New York, N. Y.; E. L. Pemberton, National Aniline and Chemical Company, Charlotte, N. C.; E. L. Puffer, Heller & Merz Company, New York, N. Y.; L. D. Post, *The Paper Mill*, New York, N. Y.

William J. Robertson, Heller & Merz, New York, N. Y.; E. V. Romaine, General Naval Store Company, New York, N. Y.; C. F. Reale, Hooker Electro Chemical Company, New York, N. Y.; Paul L. Redlich, Rotospray Manufacturing Company, Chicago; C. F. Richter, Vera Chemical Corporation, Stoneham, Mass.; Thomas Rider, H. Waterbury Sons, Oriskany, N. Y.; J. W. Raines, 196 Essex street, Holyoke, Mass.; J. G. Ramsey, Cherry River Paper Company; Richwood, Va.; Chas. E. Raney, Midwest Box Company, Circleville, O.; Michael Redmond, Kalamazoo Paper Company, Kalamazoo, Mich.; J. R. Roberts, E. I. du Pont de Nemours, Wilmington, Del.; Geo. Roeschek, Eagle Paper Company, Joliet, Ill.; Geo. J. Roschek, Eagle Paper Company, Joliet, Ill.; Fred J. Rooney, The Upson Company, Lockport, N. Y.; Edward Rootes, Cornell Wood Products Company, Cornell, Wis.; F. A. Royse, Underwood Paper Mills, Plattsburgh, N. Y.; R. R. Robertson, Champion Fibre Company, Canton, N. C.; Geo. W. Rogers, Richmond, Va.; Jas. F. Ryland, Standard Paper Manufacturing Company, Richmond, Va.

O. L. Schweickert, Bedford Pulp and Paper Company, Richmond, Va.; Alvin M. Smith, Smith Courtney Company, Richmond, Va.; E. F. Stemmler, Allis-Chalmers Company, Milwaukee, Wis.; Wm. N. Sullivan, Richmond, Va.; Standard Paper Manufacturing Company, Richmond, Va.; C. J. Slack, Adirondack Mineral Company, Carthage, N. Y.; W. H. Scott, Durioron Company, Dayton, O.; Fred L. Smith, Paper Mill Engineering, New York, N. Y.; E. H. Stoddard, Appleton Woolen Mills, Appleton, Wis.; Harry Sinclair, Bennett, Ltd., Canada; Thos. H. Savery, Jr., Nash Engineering Company, Chicago, Ill.; R. J. Spitz, General Naval Stores Company, New York, N. Y.; R. E. Sears, Shartle Bros. Machine Company, Middletown, O.; Richmond W. Smith, Bird Machine Company, Walpole, Mass.; R. C. Stewart, Shartle Bros. Machine Company, Middletown, O.; V. Salmonson, Riordon Pulp Corporation, Tamiskaming, Quebec; James Salter, Victoria Paper

Announcing The no. 3 Hercules Jordan

Insures Uniform Brushing and Refining-Uniform Knife wear in the Shell, and-BETTER QUALITY STOCK....



A JORDAN in which the plug is for all stages of knife wear, central to the thousandth of an inch.

A JORDAN in which, when changing fillings, the time from turning off the stock until the stock is again flowing through is from three to four hours with no shortening of knife life or loss of time and production due to grinding in of the knives with sand. Plug or shell filling of the one-piece interchangeable type can be arranged in approximately one-tenth the time required to change the old style, loose individual knife and wood filler. Any other type fillers can be furnished.

A Solid Self Contained Unit Throughout

Design and distribution of metal throughout such as to insure rigidity and long life with

Maximum Production and Minimum Horse Power Required

Write for full description of the No. 3 HERCULES JORDAN

THE HERMANN MANUFACTURING COMPANY

LANCASTER, OHIO

WATEROUS LIMITED, BRANTFORD, CANADA
Canadian Representatives

Mills, Fulton, N. Y.; J. Carl Schmidt, E. I. du Pont de Nemours Company, Philadelphia, Pa.; Henry Schuh, Carolina Fibre Company, Hartsville, S. C.; John S. Schumaker, Lincoln, N. H.; H. W. Server, Miami Paper Company, W. Carrollton, O.; Wm. H. Sievert, Michigan Carton Company, Battle Creek, Mich.; Jos. H. Slater, Escanaba Pulp and Paper Company, Escanaba, Mich.; Jack Smith, Gardner Harvey Paper Company, Middletown, O.; L. E. Smith, Nekoosa-Edwards Paper Company, Nekoosa, Wis.; Ward Smith, Philadelphia Paper Manufacturing Company, Manayunk, Philadelphia, Pa.; J. Norman Spawn, Champion Fibre Company, Canton, N. C.; R. J. Sprang, Champion Fibre Company, Canton, N. C.; Edward L. Stansel, Provincial Paper Mills, Mille Roches, Ont.; John Howard Stansell, W. Carrollton Parchment Company, W. Carrollton, O.; Wm. P. Sullivan, The Ruberoid Company, Joliet, Ill.; A. Suter, Bogalusa Paper Company, Bogalusa, La.; Wm. H. Sutherland, Penn Fibre Board Company, York, Pa.; Douglas E. Scott, The Adams Bag Company, Chagrin Falls, O.; Stephen W. Smith, Smith, Bird & Son, Inc., E. Walpole, Mass.; B. K. Steadman, Standard Paper Manufacturing Company, Richmond, Va.; Chas. H. Spangler, Standard Paper Manufacturing Company, Richmond, Va.

A. A. Tanyane, THE PAPER TRADE JOURNAL, New York, N. Y.; W. H. Tharoux, The Paper and Textile Machinery Company, Sandusky, O.; A. C. Tatnall, Wm. E. Hopper Sons Company, Philadelphia, Pa.; C. K. Textor, Northwest Paper Company, Cloquet, Minn.; P. F. Thackenthall, Phipps and Bird, Richmond.

R. H. Undertown, Heller & Merz Company, Philadelphia, Pa.

J. E. Vest, Standard Paper Manufacturing Company, Richmond, Va.; Geo. Voght, Wausau Sulphate Fibre Company, Mosinee, Wis.

Daniel J. Walsh, The Parker Young Company, Lincoln, N. H.; Lewis E. Weiser, National Folding Box Company, New Haven, Conn.; Fred B. Wells, Ohio Box Board Company, Rittman, O.; S. Carroll Wentz, P. H. Glatfelter Company, Spring Grove, Pa.; J. J. White, Victory Theatre Building, Holyoke, Mass.; Mark Whitman, Marathon Paper Mills, Rothschild, Wis.; A. C. Wightman, Knowlton Brothers, Inc., Watertown, N. Y.; J. J. Williams, Halifax Paper Corporation, Roanoke Rapids, N. C.; Frank E. Winslow, General Electric Company, Philadelphia, Pa.; Forbes Wood, Newton Paper Company, Holyoke, Mass.; E. L. Wren, Roanoke Rapids Board Company, Roanoke Rapids, N. C.: Geo. K. Walker, Finch, Pruyn and Company, Glens Falls, N. Y.; M. R. Ware, 50 E. Brown street, Norristown, Pa.; C. L. Wagner, J. O. Ross Engineering Company, New York, N. Y.; W. J. Wood, Electro Bleaching Gas Company, New York, N. Y.; W. Weston, American Wringer Company, Woonsocket, R. I.; A. E. Waugh, United States Rubber Company, Philadelphia, Pa.; C. A. Wardsworth, C. A. Wardsworth Company, New York, N. Y.; W. B. West, E. D. Jones and Sons, Pittsfield, Mass.; Edward Weber, National Aniline and Chemical Company, Chicago, Ill.; R. M. Watts, Cheney Bigelow Wire Works, Springfield, Mass.; W. H. Willard, National Aniline and Chemical Company, Charlotte Drive, New York, N. Y.; S. C. Willey, Atterbury Brothers, New York, N. Y.; D. B. Williams, Adirondack Minerals Company, Carthage, N. Y.; J. C. Watkins, Chesapeake Paper Stock Company, Richmond, Va.; C. O. Vatney, Pacific Pulp and Paper Industry, Seattle, Wash.; Julius Weiner, Standard Paper Manufacturing Company, Richmond, Va.; H. Williamson, Champion Fibre Company, Canton, N. C.; R. E. Winfree, Richmond, Va.; F. P. Wilmer, Albemarle Paper Manufacturing Company, Richmond, Va.; R. C. Woodhead, Albemarle Paper Manufacturing Company, Richmond, Va.

John F. Yordy, Howard Paper Company, Urbana, O.; C. E. Youngchild, Nekoosa Edwards Paper Company, Nekoosa, Wis.

The Department of the Interior at Ottawa has secured premises for the housing of the Forest Products Laboratories in Ottawa, and has definitely decided to remove the laboratories from Montreal in the near future.

W. H. Donaldson Visits Tacoma

TACOMA, Wash., May 3, 1927.—Great possibilities for establishing the paper and pulp industry on a large scale in southwest Washington, with Tacoma possibly as a major center of activity, are seen by William H. Donaldson, pulp expert of New York, who has just concluded a week of investigation of the advantages offered by this section for such industry.

Mr. Donaldson is manager of the pulp department of Perkins-Goodwin Company of New York, founded in 1843, and is said to have a wide acquaintance with the industry as it is operated in the eastern part of the United States and Canada.

He was invited to make a study of the pulp manufacturing conditions here by the newly organized Tacoma company of the Northwestern Pulp and Paper Corporation of New York, which has just obtained a license to operate in Washington, and while here was taken around by William Stuart Dowd, vice president and general manager of the company, who is now arranging details for the company's operation here.

In a statement made yesterday, Mr. Donaldson said that as a result of conferences with leading industrialists and bankers of the city and visits to various industrial centers nearby, he believes he has got a reliable and conservative picture of the pulp manufacturing possibilities here, and is of the opinion that Tacoma offers outstanding advantages for this industry.

The eastern visitor will make a trip to Longview today, then will return to New York.

Fatally Injured at Fenimore Mill

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., May 31, 1927.—Percy Clough, a machine tender at the Fenimore mill of the Union Bag and Paper Company, was the victim of a peculiar accident early on the morning of May 25. Mr. Clough was working around the machine when, in some as yet unexplained manner, a paper reel weighing approximately six hundred pounds became loose and without warning of any kind fell striking him. While no one witnessed the accident it appears that when the reel fell it struck him a glancing blow in the chest knocking him to the floor, the reel landing on his right leg which from the knee down was crushed to a pulp.

He was removed immediately to the first dispensary and first aid was administered after which he was rushed to the Glens Falls Hostital. While everything possible was done for the injured man he failed to respond to treatment and died three hours following the accident.

Mr. Clough, who was employed on the night shift at the Fenimore Mill, was about 35 years old and had been employed by the company for a number of years being very popular with his fellow workmen. He leaves a wife and one son.

Binders Board Standardization

O. M. Porter, Assistant Secretary of the American Paper and Pulp Association, reports definite progress towards standardization in the Binders Board industry. The manufacturers of Binders Board are recommending the establishment of five stock sizes. The larger consumers, represented by the bookbinders and publishers, would increase the number of stock sizes to ten. Mr. Porter reports prospects of complete accord in this matter and official recognition of these stock sizes by the Department of Commerce in the near future.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., June 1, 1927.—The Bureau of Supplies and Accounts, Navy Department, will receive bids on June 14 for 286,000 rolls of toilet paper for delivery at various yards on the east coast. Bids will be received on the same date for 295,000 rolls for delivery at West Coast navy yards.

SUPERINTENDENTS

Everywhere
Approve
The

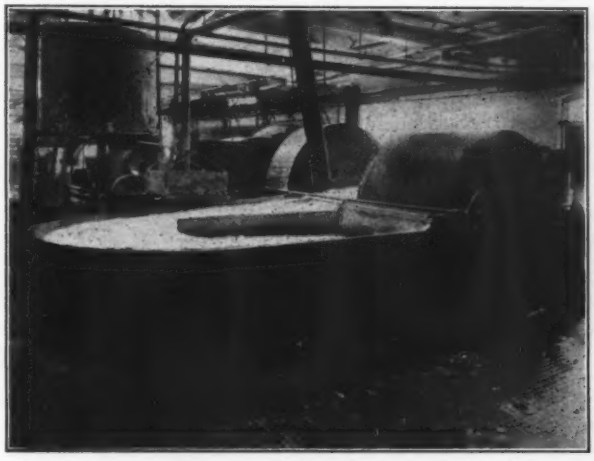
Dilts New Type Beater-The Common Sense Beater

Because

It DOES Beat And Circulate Faster, It DOES Carry Heavier Stock And Mixes Color Better And It IS More Economical Of Power

If you are planning changes in your beater room you should know about these latest refinements—or perhaps you would be interested in letting us rebuild your present beaters to this common sense NEW TYPE design.

"Your Paper is made in Your Beaters"



Here is an old beater rebuilt into the Dilts approved NEW TYPE. We used customer's old roll, stands, tub ends, bedplate box, baseplate, etc. That the results were satisfactory is evidenced by orders for *six* more rebuilt beaters and *three* new beaters.

Dilts

MACHINE WORKS, Inc. FULTON, N.Y.

EXPORT OFFICE ~15 PARK ROW~ NEW YORK CITY

Demand for Paper Is Sluggish in Chicago

Cold and Rainy Springtime Retards Mercantile Season and Affects Paper Market—Prevailing Request for Various Grades Light and Mostly for Hand-to-Mouth Requirements—Prices Generally Holding Up in Satisfactory Manner

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., May 28, 1927.—The final week of May finds Chicago in a general business slump not of an alarming nature but serious enough to cause retailers and jobbers to watch all items of expense. The paper trade is suffering along with the rest of them. Whereas March, April and May might be considered three of the peak months in the paper trade, jobbers are complaining that demand is sluggish and that conditions are worse than they ordinarily should be.

Coarse papers are not in any great demand. One of Chicago's most prominent representatives of this grade of paper is quoted as saying that business is very poor, that there is no demand and that his house, in particular, is cutting expenses to the limit and stands prepared to shave them even lower yet.

An unusual condition also prevails relative to mill buying. Many houses do not have an order at the mills but what is already taken care of. No advance paper is being made up for these firms until the demand is there to take care of it immediately.

These hand-to-mouth methods have been forced on the jobber by the consumer but they, nevertheless, may be the means of saving the former much trouble if conditions become worse. No dead stock will be on hand to cause any difficulty if houses have followed this principle, according to reports.

There is little price cutting in any lines, due chiefly to the fact that jobbers and mill representatives are sane enough to realize that there is no use making fancy low prices when the demand is not there to absorb the paper. A cold and rainy spring has had a lot to do with retarding the mercantile season and this, of course, reflects on certain grades of paper.

Book paper is still reported as below par in demand, while cover paper, strong in a few mills, is not in that enviable condition generally. The kraft situation still remains a subject of much discussion and diversion of opinion. The majority of the jobbers and representatives approached on this subject seem to feel that there is plenty of kraft to take care of any curtailment of supply caused by the flood situation. Old papers continue to be weak.

Costs of Cartage Discussed

The Chicago Paper Association held a meeting Tuesday, May 24, at the new Bismarck Hotel. A large number of members attended the dinner and discussion following. The general subject continued to be a report on the costs of cartage. Members found that there was quite a variance in cartage costs as well as a variance in equipment. The many opinions given as to the solution for these problems were consolidated and will be made into a report to be printed and distributed to members of the organization.

The label that goes on all products sent out by members of the Chicago Paper Association is now in use and is meeting with favor by all acquainted with it. The label reads, "This certificate guarantees the within merchandise to be as represented and the size, weight, count and quality to be as specified. This label may be used only by members of the Chicago Paper Association and the obligations hereunder are further secured by a bond issued by the Fidelity and Deposit Company, of Maryland, running to the Chicago Title and Trust Company, of Chicago, as trustee for the benefit of all purchasers of merchandise from members of the association." The member's firm name is then placed below the printed guarantee.

In the comparatively short time that the Chicago Paper Association has been in existence it has done a great deal towards stamping out evils that previously existed among local coarse paper dealers. Instead of making the association a somewhat social affair, the directors of the body have endeavored to educate all members in better business methods. As one member expressed it, "We leave out the apple sauce and get the real business out of it."

Import Paper Co. in New Quarters

The Import Paper Company, recently moved to 740 West Adams street, has one of the finest and largest open stocks in the city. The fine paper house is well equipped to handle any immediate demands made by customers. A trip through the offices and stock rooms of the company under the guidance of L. C. Witkowsky, sales manager, reveals the immense floor space available. A total of 40,000 square feet of floor space is ready for use and a large part of it is occupied with a well rounded stock. The 190 foot depth of the building and the use of three floors also makes for a compact arrangement of stock. The basement floor provides 18,000 square feet and the doors are all raised to prevent any damage to stock by water.

A daylight cutting room in the rear of the second or main floor is also an important addition. Mr. Witkowsky affirms that, although no new lines have been added, all lines have been greatly increased and made ready to meet any ordinary demand. The floor space offers 33 per cent more than in the Import Paper Company's old location on South Wabash street, while Mr. Witkowsky declares that facilities have been so improved that the capacity of the business has increased about fifty per cent.

News of the Trade

The Murnane Paper Company has added several lines to its fine paper department that are attracting attention among representatives of the trade. These three lines, according to Joseph Murnane, are Manifold papers, Mimeograph Bond and Mimeograph Book. The lines are standard and reflect the growing importance of the company's fine paper line which has been handled less than three years.

Dwight brothers have added two lines recently. Hollingsworth Bond, an exceptionally high grade sulphite paper offered in white and ten other colors, is proving a good seller while a line of Reconstruction Cover paper, made by the District of Columbia Paper Manufacturing Company, of Washington, D. C., is also very popular. The latter line is also carried by the James White Paper Company, well known Chicago book and cover house.

The West Virginia Pulp and Paper Company recently issued a very attractive brochure to printers and other interested representatives of the paper trade. It is the 24th issue of "Inspirations for Printers" and contains illustrations in colors and a plentiful supply of text that adequately covers methods of dealing with the use of color in printing.

Walter J. Cox, Western Sales Manager of the Paterson Parchment Paper Company and official of the Salesmen's Association of the Paper Industry, returned from California last Sunday following an extensive stay in an effort to completely regain his health. Mr. Cox was operated on for appendicitis during the winter months and, failing to recover properly, went to California as the final tonic. His many friends will be glad to know that he is now in the best of health and able to be actively engaged in his duties. While in California Mr. Cox attended the Pacific States Paper Trade Association meeting at Del Monte.

Noble Gillette, vice president of the National Paper Trade Association, returned to Chicago last Saturday, May 21, from the meeting of the Pacific States Paper Trade Association at Del Monte.

(Continued on page 44)

actual service that proves

Excerpts from letters in our files. Names on request.

Naturally, the efficient performance of Noble & Wood engines is of importance to this company. Therefore, when a refill job is necessary, it is only good business to use Noble & Wood tested fillings.

These fillings are the best we know how to make. Before offering new steel or bronze to the paper industry, fillings are made and tested in actual service. We *know* how these bars will act under varying conditions, that they will withstand the wear and tear of beater and jordan. Chemical and physical analysis isn't enough. It's the hammering of roll and plug that tells.

The wood, too, is carefully selected. Only clear maple or white oak is furnished. Free from knots—thoroughly seasoned.

When in need of beater or jordan fillings, get in touch with us. We carry an ample stock on hand—steel, bronze and wood. Urgent orders can be shipped within 24 hours of receipt. And before shipment is made, every bar, wood, steel or bronze is carefully inspected.

The NOBLE & WOOD MACHINE CO.

Hoosick Falls, N. Y.

Work Progresses on New Paper Mill in Quebec

Plant of Anglo-Canadian Pulp & Paper Co., at Limoilou, Which Will Have Output of 400 Tons News Print Daily, Nearly Half Completed—Machines Almost Installed in 250 Ton News Print Plant of Ste. Anne Paper Mills, Ltd., at Beaupre—Forestry Research Service

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., May 30, 1927.—A despatch from Ottawa states that Canadian scientists are investigating the possibility of the manufacture of a substitute for gasoline out of the wastage in the numerous sulphite plants throughout the Dominion. These mills are wasting tremendous quantities of liquor which is a potential source of alcohol. Recommendation that the National Research Council of Canada undertake research work in this direction was made by the Associate Committee of Physics and Engineering of the Council which conferred at Ottawa a few days ago.

The committee, in its report, pointed out that while alcohol had less heating power than gas, properly designed motors will operate at great efficiency on a mixture of alcohol and benzine, so that under favorable conditions the mileage obtained per gallon is fully as great as that obtained from gasoline. Research work in substitutes for gasoline have been carried out for years by scientists in Europe.

Good Progress on New Mills

Work on the two paper mills now being erected in the vicinity of Quebec is progressing very favorably. At the plant of the Ste. Anne Paper Mills, Ltd., at Beaupre, which is to have a daily capacity of 250 tons of news print, the paper machines are almost installed and will start testing shortly.

The 400-ton news print mill of the Anglo-Canadian Pulp and Paper Company's plant at Limoilou is nearly half completed, and satisfaction in the progress of the work is reported by the contractors. The first two machines will be in operation by November next, and the company will then immediately commence the installation of the remaining two machines, which, it is expected, will be in operation by June of 1928.

News Print Machine Company Successful

Earnings of Charles Walmsley & Co. (Canada), of Montreal, a subsidiary of the famous English paper machine manufacturers, during the year ended March 31 last, amounted to roughly $180,000, or three times interest requirements on the $1,000,000 6 per cent first mortgage bonds outstanding. There was also an appreciation of assets which at the end of last year, after allowing for depreciation, amounted to almost $3,000 for each $1,000 bond outstanding.

This company was incorporated in 1923 to take over the assets and undertakings of the Armstrong, Whitworth of Canada, Ltd., and is controlled by the Sir W. G. Armstrong, Whitworth & Co., of London. A large number of news print machines installed throughout Canada are the product of the Walmsley plants, made either in England or at the Canadian plant. Some of the well-known news print companies operating Walmsley machines are: Price Bros. & Co., E. B. Eddy Company, Brompton Pulp and Paper Company, Provincial Paper, Ltd., and other companies. The plant of the company has been operating at or near capacity for the past four years.

Newspaper Tax in New South Wales

B. Millen, the Canadian commercial agent in Sydney, Australia, sends the following information to the Trade and Commerce Department at Ottawa: "An act was recently passed by the Legislature of New South Wales whereby a tax of one halfpenny per paper was imposed on all newspapers having a circulation of 15,000 copies, and for some months newspaper proprietors collected the tax from the purchasers of papers. The proprietors, however, appealed to the High Court of Australia against the tax on the ground that it was unconstitutional. This contention has been upheld and a decision given in favor of the proprietors, who now state that they will pay over to the hospitals the moneys collected as a tax. As the Government subsidizes pound for pound raised by the hospitals, instead of collecting the estimated revenue of £600,000 per annum, it will be called upon to pay a very large additional sum on its own account as a subsidy to the hospitals."

Research Work in Quebec

Developments in the Forestry Research Service of the Provincial Department of Lands of Forests, Quebec, are being planned on a large scale, and soon, it is announced, there will be instituted a new department in which the public can receive instruction in forestry science. For some years the Department of Lands and Forests has had a research service and much work has been done, but an endeavor is being made to augment considerably the work of the service.

CHICAGO DEMAND SLOW

(*Continued from page 42*)

N. A. Schoenbucher, secretary of the Wrapping Paper Division, is expected back in Chicago at any time. Mr. Schoenbucher and Mr. Gillette, along with Walter Cox, were Chicago's representatives at Del Monte.

Perry W. Lesh, of the C. P. Lesh Paper Company, Indianapolis, Ind., was in Chicago last week. A part of his time was spent attending the meeting of the Central States Paper Trade Association at the Union League Club.

The next meeting of the Paperboard Industries will be held in the East on July 20 and 21. Committee meetings will be held on July 19. The hotel at which the meetings will be held will be announced later. The Chicago meeting, held May 18, 19 and 20, was very successful both from point of attendance and from business accomplished. In the absence of President J. P. Brunt, Irving Hill, Lawrence Paper Manufacturing Company, Lawrence, Kansas, vice-president of the container group, presided at the general meeting. Following the separate meetings of the Container Group, Folding Box Group and Paperboard Group, a joint meeting was held at which the O. B. Andrews Company, Chattanooga, Tenn., and the Empire Printing and Box Company, Atlanta, Ga., were elected to membership in the association, the former into active participation in all three groups and the latter into the container and folding box groups.

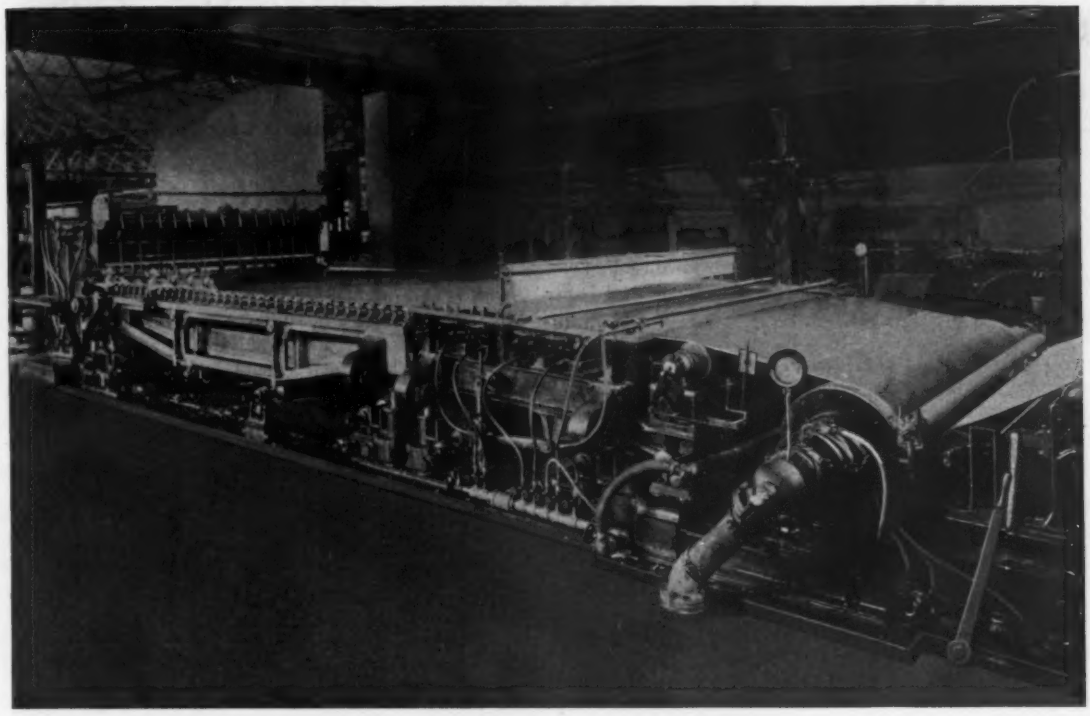
Bob Fleischer, of the Century Paper Company, Indianapolis, was in Chicago two days during the past week and also attended the meeting of the Central States Association.

J. A. Carpenter, president of the Kansas City Paper House, Kansas City, Mo., attended the Central States meeting, as did Mr. Hole, who is in charge of the Carpenter Paper Company, Omaha, Nebr., a branch of the Kansas City Paper House.

Bob Butterworth, genial western sales manager of the Champion Coated Paper Company, visited at the mills in Hamilton, Ohio, two days during the past week.

Indianapolis Paper Can Co. Formed

INDIANAPOLIS, Ind., May 24, 1927.—Articles of incorporation have been filed with the secretary of state in Indianapolis showing the Indianapolis Paper Can and Tube Company has increased its capital stock from $15,000 to $30,000, of which increase $10,000 is common stock and the remainder preferred stock.



In Operation for Several Months at Jessup & Moore Paper Mill

This illustration shows a 126" Keystone Fourdrinier which makes book paper at the Augustine Mill of the Jessup & Moore Paper Co., Wilmington, Del. This machine has been in operation for several months, and the owners do not hesitate in saying that they are pleased with its performance.

The major features of the Keystone Fourdrinier are as follows: the wire can be changed or pitched without disturbing the inlet adjustment; the Couch Roll is moved back to provide slack, instead of the Breast Roll; the Table Roll and Suction Box Sections are removed independently, in two separate units. for making wire changes; only the breast roll and table rolls shake, and not the side frames supporting the table rolls.

Send for Bulletin 100

Our Products Meet Our Promises

KEYSTONE Fourdrinier

Downingtown Mfg. Co.-East Downingtown, Pa.

News Print Issue Before Canadian Courts

Prices and Supply of News Print during World War Involved—Fort Frances Pulp & Paper Co. Claims Twelve Other Organizations Did Not Supply Full Share of Paper to Canadian Publishers at Reduced Cost Agreed Upon, and Requests Accounting

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., May 30.—An unusual issue, which dates back to the days of war and involves the then prices and supply of Canadian newsprint paper is being heard before Mr. Justice Grant in the non-jury assizes, Toronto. The Fort Frances Pulp and Paper Company, Limited, are suing some twelve other companies. Plaintiffs claim that defendants did not supply their full share of paper to Canadian newspapers at the reduced cost agreed upon by manufactures. An arrangement had been made by a control board. The Fort Frances concern seeks an order declaring that defendants who supplied less than their share are liable and asks for an accounting between the parties and payment of the amount owing.

The defendants are: The Spanish Pulp and Paper Mills, Limited; Price Bros. & Company, Limited; Brompton Pulp and Paper Company, Limited; Laurentide Company, Limited; E. B. Eddy Company, Limited; Abitibi Power and Paper Company, Limited; St. Maurice Paper Company, Limited; News Pulp and Paper Company; John R. Booth estate; Canada Paper Company, Limited; Donnacona Paper Company, Limited, and Belgo-Canadian Paper Company, Limited.

Before the war, the statement of claim sets out, 87 per cent of all news print manufactured in Canada was sold in the United States. Tremendous increases during the war made it difficult for Canadian newspapers to obtain their requirements. Prices advanced so considerably as to threaten the very life of many Canadian publications.

During 1916-17 the publishers appealed to the Dominion Government on the ground that an adequate supply at reasonable prices could not be procured. A conference was held in 1917 with Dominion representatives present and Canadian manufacturers agreed to supply news print at $50 per ton for three months. Price control was also made effective in the United States but was higher than in Canada. A loss to Canadian manufacturers was the result.

If it was found impossible for each firm to supply its exact proportion to Canadian publishers, it was agreed as between plaintiffs and defendants to adjust the matter. Compensation would be given those who supplied more than their share. An order to that effect was issued by the Minister of Customs.

After various orders-in-council had been passed, increased rates were approved and agreed upon. Plaintiffs allege that the proceedings for control of supply and price ended without anything being paid to plaintiffs, or no accountings made by defendants.

Pleading jointly, the defendants deny that the controller had any legal authority and termed his power as "assumed power to adjust." They add that adjustment of the differentials was unjust and that the late Robert A. Pringle, K. C., made the order after he had ceased to be a controller. Any orders were subject to appeal to the paper control tribunal and appeals are still pending, the defense points out.

When Pulpwood Cutting and Mining Clash

Copies of a petition appealing to the Ontario Government to withdraw from sale the timber on all mining lands, have been posted at various points in the north country and are being signed by prospectors and other mining men. In this connection the *Northern Miner*, of Cobalt, says:—"The petition reopens a wide and vexing question, one which has disturbed prospectors ever since important mineral discoveries commenced to be made twenty years ago. In some areas where the timber is considered of no great value, all that is needed for ordinary mining work may be cut on the claim, if application is made and certain regulations followed. But in other sections where pulp wood or pine limits are held by paper companies of lumbermen, prospectors find themselves debarred from even doing assessment work, unless they go to a lot of trouble to secure permission.

"What helps to bring the matter to a head again is the holding up of mining work in the Abitibi and Kamiskotia fields because of the objections of the owners of the pulp wood there. Hollinger, to carry on its big Kamiskotia campaign, had to secure special permission to operate, and had to install an electrically-driven plant. The season for exploration of the field is now at hand and it would be a pity if the eagerness of the prospectors to get on the ground was restrained.

"Whether it would be wise to withdraw all mining lands from timbering operations, in one fell swoop, is debatable. In the first place, the timber in many sections was sold at times when the mining possibilities were not known to be any great worth. In justice to the country as a whole, lumbering and pulping operations must not be retarded in areas where mining operations are small.

"No one will dispute that mining is more important in a mining field than timbering. A 40-acre claim containing $100 worth of trees, too often yields millions of dollars worth of metal to permit of real argument.

"So much of the North has been sold to lumbermen or paper companies that the prospector can go to but few places and find his work unhampered. Therefore, the petition now going the rounds deserves the attention of the Government. The question is one of grave importance, it requires careful consideration if justice is to be done to all concerned."

Canadian Cellulose Co. Is Busy

The Canadian Cellulose Company, of Cornwall, Ont., of which George H. Tomlinson is general manager, recently put its new plant in operation for the production of what is known as "soda pulp." The new mill, which has been running for about a month, is turning out about 25 tons of soda pulp daily, all of which is used in the plants of the Howard Smith Paper Mills, with which the Canadian Cellulose Company is closely affiliated. The plant will, however, produce within a few weeks something in excess of 50 tons of soda pulp a day and part of the output will be marketed in the United States. The poplar wood, which is used in the plant at Cornwall, is all purchased in Ontario, and the company expects to consume over 20,000 cords a year. A cord of poplar pulp wood, when converted into paper represents around $70 in the finished product.

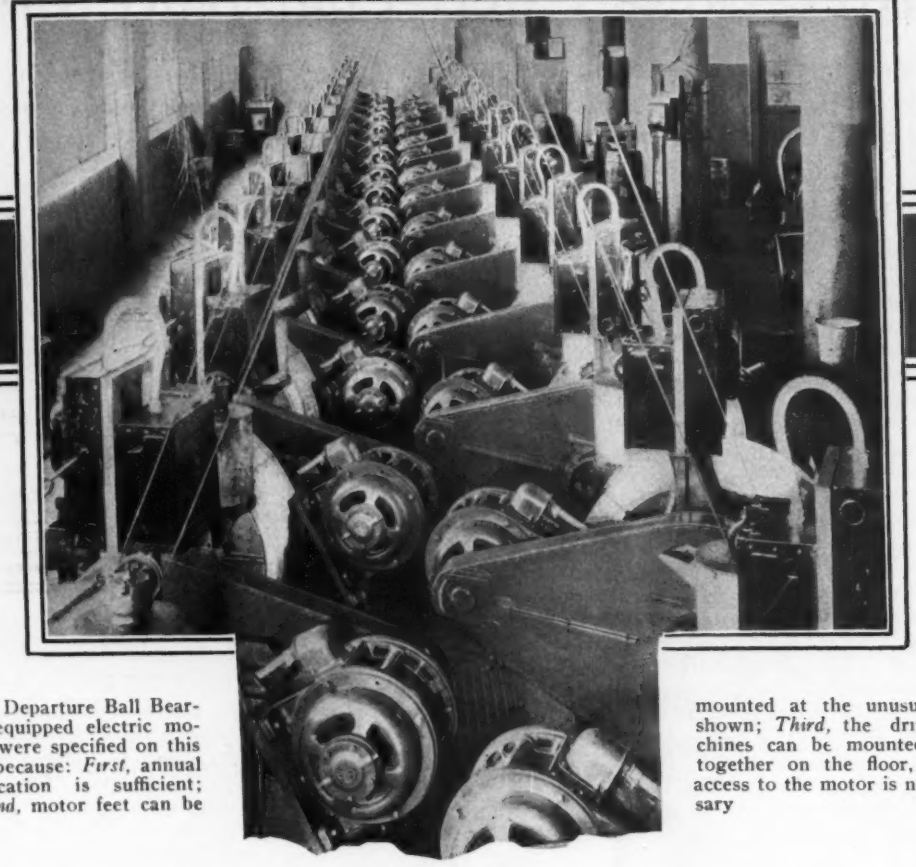
Pacific Burt Company Expanding

The annual statement of the Pacific Burt Company, of which S. J. Moore, of Toronto, is president, will be issued in a few days. The new plant at Los Angeles is completed. Ever since the Pacific Coast Sales Book Company was absorbed by Pacific Burt Company, in 1922, this subsidiary has been operating in rented quarters. It is now being moved to the new permanent factory building and will serve the southern California territory. The main, parent plant at Emeryville, serves the middle territory, while the company's plant built a year ago at Seattle, serves the northern field. The new Los Angeles plant is capacious and will allow for expansion and it is expected that business will grow. The new plant goes into operation in June.

Notes and Jottings of the Industry

Walter Woods passed away recently in Hamilton, Ont., at an advanced age. He was a manufacturers' agent and represented sev-

(*Continued on page 48*)



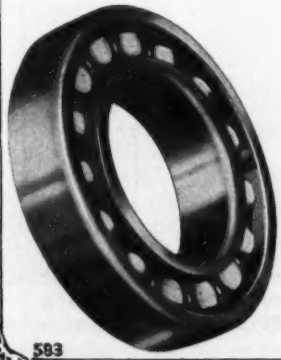
New Departure Ball Bearing equipped electric motors were specified on this job because: *First*, annual lubrication is sufficient; *Second*, motor feet can be mounted at the unusual angle shown; *Third*, the driven machines can be mounted closely together on the floor, as easy access to the motor is not necessary

New Departure Advantages and Economies Are Money Savers in Electric Motors

Write for copy of "Cutting Your Costs," non-technical treatise on the application of ball bearings to electric motors; also, "Booklet K," technical treatise on the same subject. Either or both sent on request.

Electric motors equipped with New Departure Ball Bearings operate without friction and without wear continuously and uninterruptedly requiring lubrication only once in 9 to 12 months.

Because of these superior advantages production is increased at a substantial reduction of maintenance cost proving that New Departure Ball Bearings are more economical than any other type of anti-friction bearing.



THE NEW DEPARTURE MANUFACTURING COMPANY
Chicago *Bristol, Connecticut* Detroit

New Departure Quality Ball Bearings

583

Fox River Valley Safety Conference Program

Pulp and Paper Section of Organization Completes Arrangements for Meeting, to be Held at Sheboygan, Wis., June 14—Record Attendance of Paper Mill Executives Expected, Several Mills Sending Delegates From Every One of Their Departments

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., May 27, 1927.—All preparations have been completed for the program of the pulp and paper section of the annual Fox River Valley Safety Conference to be held at Sheboygan, Wis., on June 14. Attendance of paper mill executives, foremen and workers will be larger this year than ever before, some mills sending a delegation from every department. The conference includes all industries, but due to the predominance of the paper mills, these men will have a sectional gathering and also will hear addresses at the general meeting.

C. K. Boyer, superintendent of the Interlake Pulp and Paper Company, Appleton, is one of the speakers and will use as his subject, "The Wood Room Crew Asks No Odds." Another speaker will be A. C. Remley, general manager of the Patten Paper Company, Appleton. He will take up the subject, "Habits of Safety on the Paper Machines." A third mill official on the program will be R. M. Radsch, superintendent of the Thilmany Pulp and Paper Company, Kaukane, Wis., discussing "Safe Practices in the Pulp Mill." The remaining address will be given by M. G. Hoyman, safety superintendent of the Kimberly-Clark Company, Neenah, Wis. His subject is "Placing the Responsibility for Accidents."

Among the speakers at the general session will be R. J. Knutson, of the Wisconsin Industrial Commission. His talk will be on "What Accident Prevention Means." Another subject will be "Fire, a Menace That Never Sleeps," presented by R. E. Vernor, of the Western Actuarial Bureau, Chicago. The final address will be made by G. A. Kuchenmeister, safety director of the Dominion Forge and Stamping Company, Ltd., Walkersville, Ontario. His topic will be "Every Foreman a Safety Director." A banquet will be held in the evening, but the program has not been announced.

Baling Machines Installed at Menasha

Baling machines have been placed in operation in several Wisconsin rural communities by the Menasha Paper Mills, Menasha, Wis., in order to provide a sufficient supply of straw for the straw board mill which this company started recently. About a carload of straw is being shipped in daily from these machines. The company will contract for a much larger Wisconsin straw supply during the coming season so as to eliminate long hauls from Minnesota and the Dakotas and thus reduce the overhead on raw material.

Work of removing the three digesters at the Menasha Paper Mills is almost completed. These were used by the former concern, the Island Paper Company, but were not needed by the straw board mill. Considerable difficulty was experienced in the wrecking because of the firmness with which they were built. The walls were broken up with dynamite but care had to be used so as to prevent damage to surrounding buildings. A large junk firm has purchased the salvaged iron and steel of the digesters.

Peacock Addresses Superintendent

W. J. Peacock, of the Northern Paper Mills, Green Bay, Wis., was one of the speakers at the eighth national convention of the American Pulp and Paper Mill Superintendents Association at Richmond, Va., this week end. His subject was "Safety in the Program of Modern Efficiency."

Addition to Northern States Warehouse

Construction of a two-story addition to its warehouse has been started by the Northern States Power Company, Eau Claire, Wis., which furnishes power to paper mills in that vicinity. The structure will be 61 x 82 feet in size and is of structural steel, fireproofed with concrete. The basement will be used for a garage and the first floor for a warehouse and store room. Offices of the operating departments will be on the second floor. A recreation room 30 x 40 feet in size for employees also will be established on the upper floor.

Tissue Mills Damaged by Fire

A small amount of damage and slight delay were caused by fire in a cupola at the Wisconsin Tissue Mills, Menasha, Wis., this week. It was necessary to partially wreck the cupola to extinguish the blaze. Damage was confined to the roof of the building.

Incorporation Articles Amended

Hereafter the Kimlark Rug Company, of Neenah, Wis., subsidiary of the Kimberley-Clark Company, will be known officially as the Kimlark Rug Corporation. The articles of incorporation have been amended to include this change. The capitalization also is changed so that it hereafter will consist of 1,200 shares with no par value. This company manufactures fiber rugs on an extensive scale.

BEFORE CANADIAN COURTS

(*Continued from page 46*)

eral firms handling coarse paper, as well as being interested in Pulp Products, Limited, manufacturers of egg carriers, which is carrying on business on the premises of Cameron & Fraser, Toronto, and also has a branch in Winnipeg. Mr. Woods was well known in the paper trade generally.

W. B. Carmichael, of W. B. Carmichael & Co., Sydney, Australia, was in Toronto during the past few days discussing the export paper situation with representatives of a number of Ontario mills. Mr. Carmichael reports that the prospects for increased consumption of Canadian papers in Australia are very good.

I. H. Weldon, president of the Provincial, Limited, Toronto, and Mrs. Weldon have gone on an extended trip to Great Britain and will spend some time in a motor tour to various points of interest.

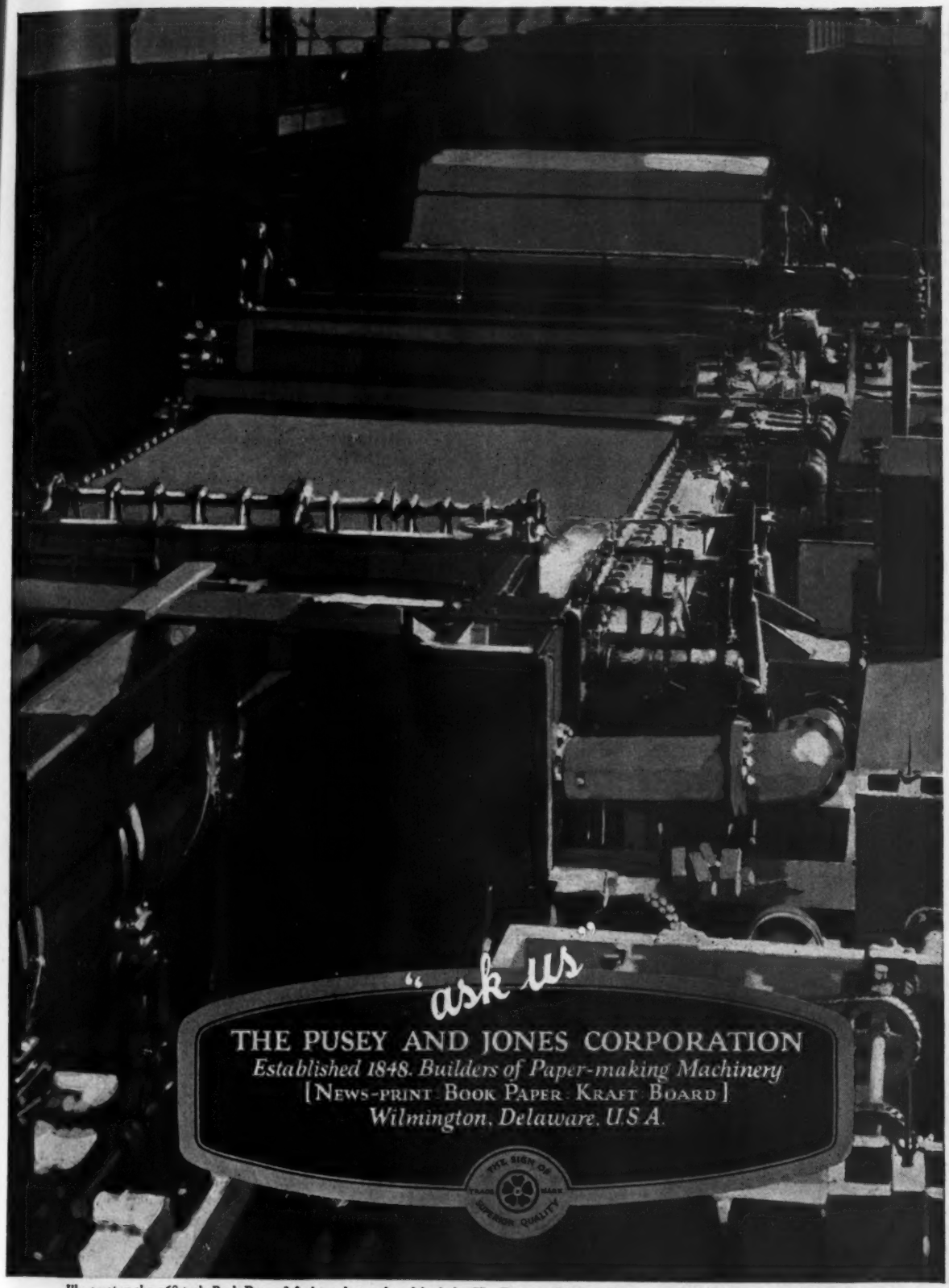
The Canada Paper Company has moved from 290 Bay street, Toronto, to larger and better premises at 109 Simcoe street. The company occupied its old warehouse, which is now being torn down, for some twenty years, and by the removal to attractive, new quarters, will possess additional facilities for meeting its constantly increasing trade.

Miami Valley Men at Superintendents' Convention

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, May 31, 1927.—The Miami Valley was well represented at the Eight National Convention of the American Pulp and Paper Mill Superintendents' Association, the last three days of the past week. Those who returned today said the meeting was one of the most profitable as well as the most pleasant, they ever had attended, and that many historical points were visited. They were loud in their praises of the hospitality extended by the "supers" of the Richmond sector.

R. L. Eminger, Miamisburg, National Secretary, was one of the busiest men at the convention, in his capacity as an official. H. W. Server, of the Miami Oxford Paper Company, West Carrollton; H. H. Cunningham, of the Mead Pulp & Paper Company, Dayton; and others from this city, Middletown, Franklin, Hamilton, Lockland, Chillicothe, joined the secretary in the jaunt to the Southern City. Some of the Miami Valley representatives were accompanied by their wives.


"ask us"
THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-making Machinery
[NEWS-PRINT BOOK PAPER KRAFT BOARD]
Wilmington, Delaware, U.S.A.
THE SIGN OF TRADE MARK SUPERIOR QUALITY

Illustrating the 168-inch Book Paper Machine designed and built by The Pusey and Jones Corporation for the Jessup and Moore Paper Company, Augustine Mills, Wilmington, Delaware . . . This is one of four Puseyjones Book Paper Machines built in 1926 . . . It is interesting to note that the first Paper Machine built by Puseyjones more than sixty years ago was made for Jessup and Moore.

Copyrighted 1927 by The Pusey and Jones Corporation, Wilmington, Delaware, U. S. A.

Paper Demand Slows Down in Philadelphia

Gradually Improving Conditions Anticipated by Local Dealers in Coming Months—Prices of All Standard Grades of Paper Generally Holding Up to Schedule—Fine Paper Market Experiences Keen Competition—News Print Situation Little Changed

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., May 30, 1927.—Now that the bulk of the seasonal buying has been effected and business shows signs of slowing down to spotty day to day purchases, dealers are confronted with prospects of the coming summer orders. While the paper market has been drifting into a hand to mouth affair, the dealers are looking ahead towards a continuance of this sort of buying throughout the summer in realization that stocks of all grades of paper in hands of the consumers are low, and that there has been no preparation for the future supply on large scale.

Summer Outlook For Steady Market

Local dealers are convinced of gradually improved markets with the coming months. Both consumers and dealers are not seeking the usual price inroads that have been customary at the turn of the season, with the advent of hot weather, owing to the lack of heavy supplies at this time. Prices on all standard grades of paper are holding to the values that have prevailed since last fall with very few exceptions in recessions of a fractional amount on some of the specialties that are not as greatly in demand as the popular products of every day consumption.

Fine Paper Moving to High Pressure Sales

That the fine paper market is subjected to high pressure sales effort is verified by the fact that it takes considerable persuasion to land orders in the keenly competitive markets among the consuming trades. With larger contract orders a rare occasion in the present situation, the distributors have been working on the small type of purchasers and most of the recent demand has been garnered from the sources of immediate supplies that are required for the printing and allied industries. But it takes constant plugging to land any appreciable amount of orders and where the high cost of overhead is to be considered in handling the day to day type of buying, a broad patronage is necessary to meet the upkeep in cost of business.

News Print Situation

That the news print situation as it pertains to the Philadelphia trade is in keeping with the general condition of the nation is verified by comparison with reports from Washington and the government's summary of this branch of the industry. There is very little of the Scandanavian products entering this port and the imports of pulp wood are negligible. Both news print and pulp from Northern Europe have been subjected to fractionally lower quotations. American made news print from the northern and Canadian manufacturers is being purchased at the steady prices of the past year or more. There is not much demand for newsprint in small lots, most of the consumption among the larger newspapers and publishing industries being bought under the contract prices made at the first of the current year.

Coarse Papers Continue Fair

While the coarse paper markets continue fairly active in view of the seasonal declining of activity in the industrial world, the demand for wrapping paper is the most notable of the list of active products. There are alternating good and slow days for the dealers but on the whole the small orders amount to fairly maintained proportions despite the waning of the season. There is keen competitive bidding for orders among the wrapping papers dealers and hard plugging must be applied to secure orders. Tissues have remained unchanged. Butchers fibres are less in demand and are slowly giving way to the kraft wrapping paper substitutes for these former broadly distributing grades. The consumer is contented with the kraft substitutes because of its grease resisting qualities, and many now use these instead of the fibres. Building papers are in demand. Repairing and seasonal renovations of buildings are now the sources for the consumption of building paper supplies.

Philadelphians Hear From Southern Mills

With a large market for the southern made wrapping papers in in the local trade it is natural that the dealers herebouts are interested in the situation of the mills located in the flooded areas. Word has been forthcoming from the Brown Paper Company's Mills at Monroe, La. to the effect that the manufacturers will soon resume the production and shipment of papers to the Philadelphia distributors, possibly by the end of the current month. The mills were not seriously damaged by the invading waters. From the Bogalusa Paper Company, at Bogalusa, La. reports state that the mills were for a time in danger but suffered no material damage and are already resuming shipments of krafts.

Wholesale Waste Merchants Frolic

Good sportsmanship and sociability will be intermingled in the annual outing of the Philadelphia Wholesale Waste Merchants Association, to be held at the Shrine Club at Fox Chase on June 7. According to plans formulated by the Entertainment Committee, of which William J. McGarity, secretary of the association, and of the Penn Paper and Stock Company, is head, has provided a wide range in choice of pastimes for the day's program. There will be novelty sports, baseball games, and other diversions, to fill in the day, capped by a seasonable dinner at the Shrine Club. All branches of the paper stock, rag and waste trades will beb represented in the gathering.

New Officers For National Box Association

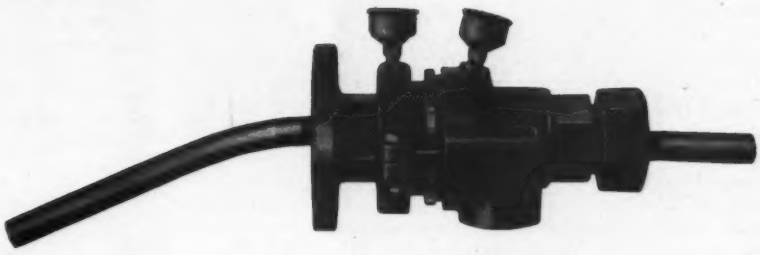
With the return of Secretary Frank Records, of the National Paper Box Manufacturers Association, to headquarters in the Liberty Bulding, Broad and Arch streets, the announcement of the election of officers at the Convention held in Chicago last week was made. Those who were elected are: President, A. G. Buiry, Fort Wayne Box Company, Fort Wayne, Ind.; Vice President, Walter Trum, E. J. Trum, Inc., New York; Treasurer, Frank Records, also Secretary of the association. The directors elected were New England Division, Frank C. Babcock, West Somerville, Mass.; Central Division Frank Stone, Philadelepria, Pa.; Eastern Division, William Reichert, Eli Baldwin Company, New York.; Southern Division, Paul Clement, Atlanta Box Company, Atlanta, Ga.; Western Division, George A. Kroech, Kreock Paper Box Company, Chicago, Ill.

Box Supply Men at Convention

Paper dealers and those affiliated with the supply trades catering to the paper box manufacturing industry and paper converting branches were represented in the special program of the associated membership of the National Paper Box Manufacturers Association's Convention at Chicago last week. From the local paper trade and paper converting machinery manufacturers a fair representation took part in the exhibits and business and social sessions at the Palmer House. Among the Philadelphians from trade ranks who attended were:—Walter P. Miller, Crescent Paper Products Company; Charles Griffith, Pinco Papers, Camden, N. J.; F. Welsh, Paper Service Company; Cornelius Schuck.

Smith Dryer Joints at the Oswegatchie Paper Company, Natural Dam, N. Y.

Smith Patented Dryer Joints



Lower Drying Pressure with increased speed and production

Smith patented Dryer Joints certainly do make a difference. One prominent paper mill reports that after Smith Dryer Joints were installed the required steam pressure was reduced from 14 lbs. to 5 lbs. They also say, that as there is no pressure equalization in the dryer when Smith Joints are used, the dryer speed can be increased with a consequent boost to production.

How are your dryers equipped? Ask for the bulletin.

A few of the mills in which several Smith Dryer Joints are installed.

Great Northern Paper Co., Millinocket, Me.
International Paper Co., Berlin, N. H.
Hinde & Dauch Paper Co., Watertown, N. Y.
Newton Falls Paper Co., Newton Falls, N. Y.
Malone Paper Co., Malone, N. Y.
A. P. W. Paper Co., Albany, N. Y.
Cushnoc Paper Co., Augusta, Me.
Parker Young Co., Boston, Mass.
Orono Pulp & Paper Co., Bangor, Me.
DeGrasse Paper Co., Pyrites, N. Y.
St. Regis Paper Co., Watertown, N. Y.
Brown Co., Berlin, N. H.
Spanish River Pulp & Paper Co., Sault Ste. Marie, Ont.
West End Paper Co., Carthage, N. Y.
Eastern Manufacturing Co., Millinocket, Me.

Carthage Machine Company

Manufacturers of Pulp and Paper Mill Machinery

985

CARTHAGE, NEW YORK — BELLEVILLE, ONT., CANADA

Schuck Machine Company; George Sutton, Stokes and Smith Company; Charles Matthias, Matthias Freeman; Roger Wood, Philip Rudolph Co. Among the machinery exhibits which were shown at the Chicago headquarters of the Schuck Machine Company, of Philadelphia, there were on display the device manufactured for the converting supply trade. The Beck Machine Company of Philadelphia demonstrated its non curl sheet cutter; the Globe Manufacturing Company, Philadelphia, displayed its automatic gluer; while the Dopele Company exhibited its Philadelphia produced box machinery of many types. Swift Co., of Chicago, manufacturers of converting equipment, were hosts to the supply dealers in a trip to the stock yards in Chicago. While some of the members toured the stock yards, others joined in golfing and other diversions provided by the Supply Division. There was a specially arranged banquet for the supply men at Palmet House as part of the entertainment features. Harry G. Williams, of the C. L. Laboiteaux Company, New York, was elected president of the Supply Men's Division of the National Paper Box Manufacturers Association, succeeding Charles Matthias, of Matthias Freeman, Philadelphia. The successful program and the many features in the entertainment program were carried out under the direct supervision of former President Matthias who has just returned from the Convention, where the firm with which he is associated gave an extensive exhibit of boxmakers papers in its Sunrise Line at the Palmer House.

Local Box Association Outing

Another supply men's affair which was linked with the box-making industry was the entertainment and outing given last week at the Kugler Mohican Club on the Delaware. The Philadelphia supply men joined in with the Box Makers Association in many sporting events including the base ball game in which the Supply Nine won over the Box Makers Nine and captured the silver trophy, and then partook of Shad Feast in the Club House. Among the Philadelphia paper dealers who joined in the outing were Charles Matthias, Matthias and Freeman Company; Roger Wood, Philip Rudolph Company; Charles Griffith and Will Ross and Pinco Papers, Inc.; Joseph Maertz, A. S. Datz Son; Carl Neiholm, A. Hartung, Inc., and R. J. Walsh, of the Paper Service Company.

Hammermill Agents at Regional Meeting

The Quaker City dealers handling the papers manufactured by the Hammermill Paper Company, of Erie, Pa., were among the distributors represented at the Regional Sales Conference held in New York last Friday. The eleven sales representatives from Riegel Co., Inc., 140 N. 6th street, were taken to the Regional Conference in a special train along with the forces of the D. L. Ward Company also distributors of the Hammermill Line. They left at an early hour, had breakfast aboard train, and then returned to Philadelphia by the same means of travel. Another local paper distributor of the Hammermill products participating in the Regional Sales Conference was the Thomas W. Price Company. The various distributors represented in the New England and Eastern States were guests of the manufacturers at the Conference held in the Waldorf Hotel.

Paper Men Give Educational Talks

Members of the Philadelphia Paper Trade who were among the business representatives conducted on a tour of inspection of the Continuation Classes at the McCall School, during the past week, were called upon for a word in behalf of the paper trade for the instruction of the scholars. President Herbert A. Considine, of the Paper House of Pennsylvania, gave an outline of the paper industry with regard to the production of paper from the pulp sources of supply through the manufacturing processes and the various consuming channels in the commercial world. He was followed by Harry Bailey, of the Hemingway Company, paper stock dealers, who told of the conversion of waste paper into new and the use of rags in production of various kinds of paper. The tour was conducted under the direction of the Philadelphia Typothetæ which selected representatives from the Graphic Arts Industries for the educational talks to scholars.

D. Lindsay Evans Joins Paper House

After a term of association with the sales end of the paper business of the Lindsay Paper Company, 806 Sansom street, D. Lindsay Evans was elected to the official body of the company by the Board of Directors at its meeting last week. The younger member of the company has been made its secretary. He is a grandson of Vice President David Lindsay Sr., of the company, and nephew of President David Lindsay Jr., and Treasurer Horace Lindsay. The newly elected official is executive secretary of the Philadelphia Paper Trade Association, while his uncle, David Lindsay Jr., has just been reelected president of the local organization.

Cauthorne Paper Co. Holds Annual Outing

Friends, Romans and countrymen, Ross Cauthorne and Company staged their annual party at Tappahannock, May 14, between showers. Sounds like everything was all wet? Yes and No, which answers any questions.

Invitations to this party urged all guests to leave early for a full afternoon. Practically everyone left early. The guests motored from Richmond to Tappahannock, a short fifty miles, and found everything in readiness when they arrived.

And frankly, the stage as set, looked like a crowded three ring circus. Cauthorne's cottage, about fifty yards from the shore of the placid Tappahannock, was beautifully decorated with kegs, glasses, food and crackers. The decorations were consumed in the order named.

The Cottage lawn, or the great outdoors, was equally inviting. A baseball diamond had been cleared, but the weather failed to clear with it and the game was called off, as many minor sports gained progress.

A. Y. Waddey, who doesn't like to shoot, was first with gun in hand. A. Y., as may be seen in "Buns and Hams," carried off the bacon in this trapshooting event. A bond naming contest followed. This minor sport required little or no physical exertion, so John Miller captured the other side of A. Y.'s pig. John even had some good dope on the bonds of matrimony. Also shown in: "Buns and Hams."

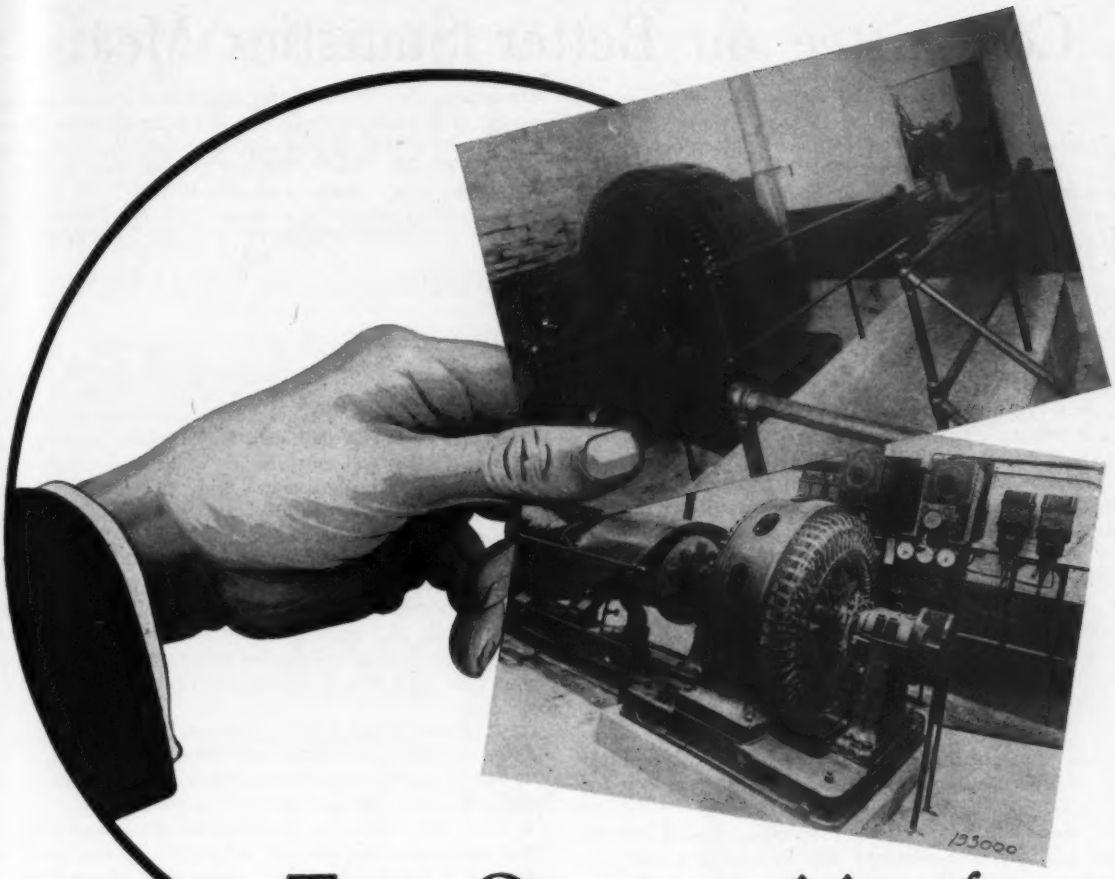
Coleman Andrews, not to be outdone, smote the golf ball for such a terrific drive that Ross decided to kill another pig, and Coleman was awarded the left hind quarter. Likewise "Buns and Hams."

And now we arrive at the fourth member of the "Buns and Hams" quartet, one Tom Hendry, champion of champions. Tom was so good in every event that he collected the fourth quarter of pork. Especially was he good in the chicken eating contest. Here Tom rested his hat on his ears and put forth his best efforts. While some accused him of being a professional, others swore he never tasted chicken before. If the latter is the case, Tom is well caught up.

Three o'clock, still P. M., found the white oak, iron bound, syphonating punch bowl removed from the cottage to the river shore, to which place the scene of festivities immediattly shifted. A delicious plate luncheon was served at this time, including devil crabs, sandwiches, pickles, olives, celery and what chicken Tom Hendry had left. Each guest, on being served, found gangway on the vertical staircase, as hair raising as Mary Robert Rinehart's, "Circular Staircase," which led to the shifted scene of festivities.

Crap shooting and other mild sports were resorted to until dusk, when the party disbanded, wined, dined—exahusted.

The Cauthorne Paper Company did themselves proud as hosts and the usual good time was had by all.



Two Opportunities *for* Balanced Power Factor

PULP grinders and Jordans are particularly adapted to synchronous motor drive. The synchronous motor can be set for a leading power factor *balancing* the lagging power factor of the induction motors. The improved power factor uses the transmission equipment more efficiently and obtains a better power rate.

The use of Westinghouse synchronous motors for these machines carries on into the application the ***balance*** found in all Westinghouse motor construction. Every element of design—electrical and mechanical—has been considered in relation to every other element and with the job to be performed. The result is a sturdy frame, long-wearing bearings, high efficiency, and low maintenance—a motor that will furnish economical power day after day without faltering.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the United States and Foreign Countries

Westinghouse
X91132
Synchronous Motors

Committee on Better Statistics Meets

The effects of over capacity and destructive competition and distribution among various grades of paper is resulting in a demand for changes in statistics along lines which will give better indication of consumption trends. This was clearly indicated at the meeting of statisticians and others interested in promoting better statistics when a committee meeing on May 18 was held at the American Paper and Pulp Association offices to recommend changes in present report forms. It was noticeable, particularly in the board and book groups, that statistics collected along the lines of use rather than according to types of production were more acceptable to those industries.

Whether or not it is the general trend in the industry it is at this time probably too early to state but there seems to be a very definite trend by various groups in the industry to collect statistics which will indicate in a better manner just to what use the various grades of paper and pulp are put.

The conclusion seems to be that there is greater interest being taken in the data concerning production, shipments, etc., and that the sales departments as well as production departments are interested in obtaining facts and figures which will be of aid in developing future plans.

C. B. Morgan, chairman of the committee, called the meeting to order at 10:15 A. M. A brief statement concerning preliminary Committee meetings and the splendid support received by many members of the Committee in preparation for the major Committee Meeting, was given by Paul S. Hanway.

Capacity

The question of capacity was considered and it was voted that there be a distinction between practical production capacity and rated capacity.

Several forms for estimating the practical production capacity for paper and pulp were submitted and the following definitions were finally accepted by the unanimous vote of the Committee.

Suggested Standardized Form for Estimating the Practical Production Capacity for Paper and Pulp

MILLS MAKING ONE OR SEVERAL GRADES OF PAPER

Mills making one or several grades of paper should figure their practical production capacities of each grade in the following manner:

Prepare a list by months of the total paper made of all grades in the best previous year. Divide the monthly production by the number of total possible regular working days in each month to obtain a daily average of all grades combined. If in any month a mill runs for a number of days in excess of the regular number of working days, i.e., when running Sundays or holidays the total number of days actually worked in the month should be used as the divisor. Select from the twelve the best six in the year and obtain an average of these to obtain the daily average practical production capacity figure. This calculation provides for short day months like February being included in the average. Multiply this figure by 310 days to obtain the annual practical production capacity figure for all grades manufactured.

Determine the percentages which the actual production of each grade of paper made in the year bears to the total actual production of all grades. The per cent figures so obtained shall be accepted as the basis for establishing the practical capacity production by grades as follows:

Total yearly practical production capacitv all grades (figures as above) x percentage of each grade made.

The results will be the total practical production capacity by grades on a yearly basis.

To obtain monthly capacity divide the yearly figure by 310 and multiply by the possible working days in each month prevailing in the industry. Adjustments should be made in daily averages for changes in machines, either for new ones added, old ones permanently discarded, or other mechanical changes causing an increase or decrease in production. An adjustment should also be made where a mill has transferred to a grade not included in the daily average. Such a change, however, must be permanent and not due only to fluctuations in orders.

NOTE.—Report such permanent changes to the Association in the regular report made following such changes.

Pulp

CHEMICAL PULP (SULPHITE, SULPHATE, SODA, ETC.) AND GROUND WOOD

Practical capacity should be figured as follows:

Prepare a list by months of each kind of chemical or ground wood pulp made in the best previous year. Divide the monthly production of each kind of chemical or groundwood pulp made in the previous year by the total possible regular working days in each month. If a mill runs Sundays or holidays resulting in the number of days actually operated being in excess of the regular number, then divide by the number of days actually operated in the month, as in paper.

Select from the daily averages of each kind of pulp the three best months in the year and obtain an average of the three averages so obtained. The result will be the daily practical capacity of each grade. For monthly or yearly statistics multiply the daily figures so obtained by the possible working days prevailing in the industry in each month or by 310 days for yearly practical capacities.

2. *Report forms used by Census of Manufactures for Paper and Pulp*

1. The Committee unanimously voted for a separate annual census for paper, pulp and converted paper products.

2. *Form 149, Census of Manufactures, Paper and Pulp:* The following recommendations were adopted concerning this form.

Items 1, 2, 3, 4, 5—No change recommended because these items are used in conjunction with reports for all industries and are a standard basis acceptable to all industries.

Item 6—Pulp to be eliminated from this report and changed in accordance with recommendations for wood pulp census (see wood pulp).

Section 7. Equipment

Pulp Machinery:

Under this heading the item in pulp machinery to be removed from paper census and included in wood pulp census with the changes as recommended under WOOD PULP.

The following suggestion was offered concerning Census of Manufactures, Form 149.

Item 7—Under *paper machines* change "total capacity per 24 hours" to read "rated capacity per 24 hours" and in the second last line under *paper machines* change "yearly capacity of mill in paper (tons 2,000 lbs.)" to read "rated yearly capacity of mill in paper, basis 310 days (tons 2,000 lbs.)."

Remove last line Section 7, under *paper machines* "yearly capacity of mill in Ground wood pulp, air dry weight (tons 2,000 lbs.)" and change as follows for inclusion in Wood Pulp census report—"rated yearly capacity of mill in wood pulp, air dry weight (tons 2,000 lbs.) basis 310 days."

Section 6 Paper

News Print and Similar Papers:

Standard news print—

In rolls—O.K.

In sheets—O. K.

Hanging—O. K.

Change Poster, novel, tablet, lining, etc., to read Poster, novel, *news tablet*, lining, etc.

The subject of catalogue paper was referred to the News Print

Opportunity is Knocking

Bringing Prospects to Your Door

As a manufacturer of a worthwhile commodity you owe it to yourself to take advantage of the opportunity offered in the

4th EDUCATIONAL

GRAPHIC ARTS EXPOSITION

GRAND CENTRAL PALACE — New York City
September 5-17, 1927

THE EXPOSITION will make new history in the world of graphic arts. On three floors of Grand Central Palace will be a most complete presentation of printing and its allied interests. The exposition will illustrate in a surprising manner the enormous strides made in the industry. World-wide interest has been manifested and leading manufacturers have arranged comprehensive exhibits. ¶The management has planned a most unusual display of features which will attract the trade and public. Annual conventions and meetings of the leading associations will be held coincident with the exposition assuring the right kind of attendance. Under no other conditions could direct contact be made with so many prospects. ¶Not merely the printing world, but the world that uses printing, will visit the exposition. There will be prospective customers of the most desirable type. ¶Secure your space while there is yet time to do so. It will be several years before another exposition of this character and scope will be held. Act now! ¶Plan to come—Come to buy, to sell, to meet old customers and friends, to make new ones. This is *your* exposition. Be an active part of it. Its success will reflect credit on the entire industry.

NATIONAL GRAPHIC ARTS EXPOSITIONS, *Inc.*

461 Eighth Avenue, New York, *Room 1916*

A. E. GIEGENGACK, Exposition Manager **TELEPHONE LACkawanna 5831-2**

The following associations, by whom the 4th Educational Graphic Arts Exposition has been organized, will convene in New York coincident with the Exposition

THE INTERNATIONAL ASSOCIATION OF PRINTING HOUSE CRAFTSMEN
INTERNATIONAL PRINTERS SUPPLY SALESMEN'S GUILD
INTERNATIONAL ASSN. OF ELECTROTYPERS OF AMERICA
UNITED TYPOTHETAE OF AMERICA
INTERNATIONAL TRADE COMPOSITION ASSN.
EMPLOYING BOOKBINDERS OF AMERICA

Service Bureau for final recommendations as to whether it be included or removed.

Book Paper—The following new classifications were recommended to be substituted for those now included in the census form. Book Papers, Lithographed, Offset, Body stock for coated paper, All Other.

Since coated paper is a converted product it was recommended that it be removed from the paper census and included in the census for converted papers.

Cover Paper—No change.

Fine Paper—Change to Writing Paper (Fine).

Change sub-division and classification "Chemical Wood Paper" (include sulphite bond) to the following: Sulphite Bond, Other Chemical Wood Papers.

Wrapping (or coarse) Paper

It was recommended that first item "Bag" be changed to read for "Bag."

Other recommendations were:

1. Bleached Fiber to be changed to read "Bleached Sulphite" and "Fibre" to be changed to read "Unbleached Sulphite."
2. That classification "Manilas" be divided as follows:
   Rope, Jute, etc.
   Ground Wood and Chemical Manila.
3. Tag Board and Manila Board to be removed from Wrapping Paper classification and included in Boards classification.
4. That Kraft have as sub-headings, Northern Kraft, Southern Kraft, Pacific Coast Kraft.

It was recommended that the above suggested changes be referred to the Wrapping Paper Manufacturers Service Bureau for their early consideration and recommendations to the Committee for final presentation to the Department of Commerce in corrected form.

Boards—The following changes in classifications were recommended by the Paperboard Industries Association:

1. CONTAINER BOARDS
   Liners
   Chip (plain and test)
   Straw (for Corrugated Container use)
2. FOLDING BOX BOARDS (BENDING)
   Manila Lined (all lined boards)
   Patent Coated
   Other (include shell and unlined boards)
3. SET-UP BOX BOARDS (NON BENDING)
   Chip and Straw
   Newsboard
   Other (incl. tube, egg filler, pasted news and chip boards)
4. BUILDING BOARDS
   Wall board
   Insulating
   Other
5. BINDERS BOARD
6. CARD BOARD
7. OTHER

This subject, because of the suggested drastic changes, was referred to the following Committee: E. O. Merchant, Grafton Whiting, Kendall Wyman, O. M. Porter, Paul S. Hanway.

Tissue—Present sub-divisions or classifications satisfactory.

The following was suggested as a foot-note under Tissue Paper.

"Tissue Mills should report mill product only whether for sale or for conversion. Converted Tissue Papers to be included in Census for converted papers."

Absorbent Paper—No change.

Building Paper—The following suggestions were offered by the building paper group.

Change classifications to read: Sheathing papers, Felts, Asbestos, Other building papers.

NOTE.—Converted products not to be included in this census.

Asbestos Filled—To be removed and included in census for converted papers.

All Other Paper (Specify)—No change.

Paper Bags—To be removed and placed in census for converted papers.

Paper Boxes—To be removed and placed in census for converted papers.

All Other Products—To be removed and placed in other census forms.

Section 7—Paper Machines—Under "kinds of paper made" change Fine Paper to read Writing Paper.

Other suggested changes concerning capacity under "fourdrinier" and under "cylinder" were included in the first section of this report as were also the last two lines referring to yearly capacity.

Value—Referring to all grades of paper and pulp—to be changed to read *Market value, f.o.b., mill.*

Section 6, Paper and Pulp

Products—Change to read "report the quantity of all products manufactured during the year (whether sold or not) including by-products and the market value of body stock to be used for conversion and the value at the mill of all products manufactured for sale."

This item should be included in the census for Paper and with the following change, should be included in the census for Pulp: Remove that portion which reads—"include market value of body stock to be used for conversion."

Item 8—Power—It was recommended that a committee be appointed to report officially to the Department of Commerce recommendations of the paper industry concerning sub-division under this classification, for the consideration of a committee to meet at Washington for discussion of this subject for all industries.

The following committee was appointed: George D. Bearn, G. A. Ware, D. A. Wilcox.

It was further recommended that this item "Power" be included in both census forms—paper and pulp.

Wood Pulp

1. *Pulp Machinery*

Capacity to read "total rated capacity per 24 hours (tons 2,000 lbs.)" and "total rated yearly capacity 310 days (tons 2,000 lbs.)."

Change "total capacity of all per cook (tons, 2,000 lbs.)" to read—"Rated capacity, 24 hours."

Change "total yearly capacity of mill (tons, 2,000 lbs.)" to read, "Total rated yearly capacity of mill (tons, 2,000 lbs.)."

Change classification in pulp to read as follows: Sulphite, Unbleached—News grade, Strong, Easy Bleaching, Mitcherlich.

Sulphite, Bleached—Change term "rated capacity" to read "total rated capacity" throughout.

Wood Pulp to have two separate general classifications set up as follows:

The first to read "Wood Pulp for Paper and Paper Products," the second to read "Wood Pulp for Rayon and Other Cellulose Products," and "All Other."

In addition, it was suggested that the term Semi-Chemical Pulp be considered and a place found in the Wood Pulp Census for this growing classification.

It was recommended that "air dry weight" be used in figuring wood pulp tonnage.

Pulp Wood

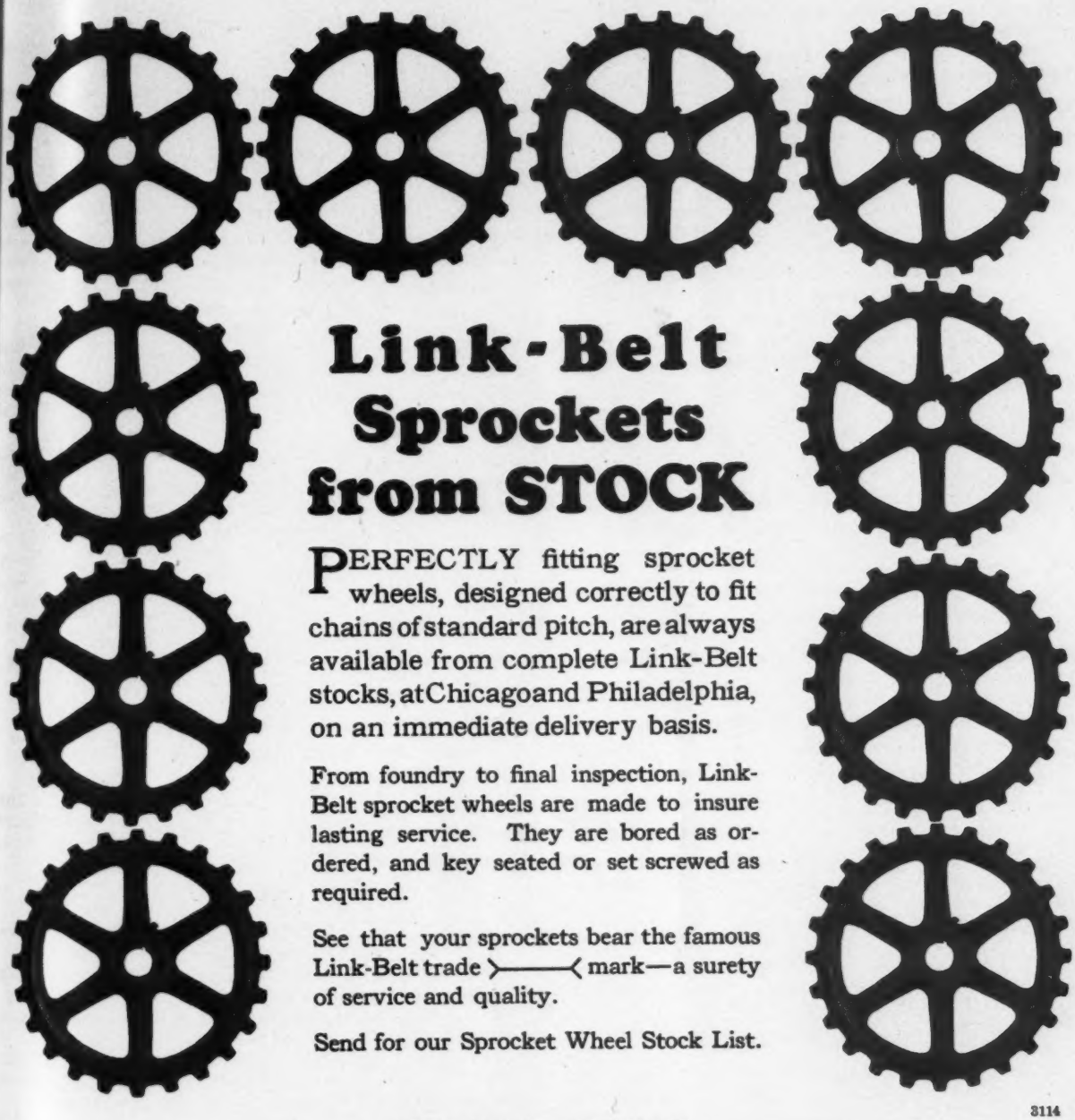
The elimination of items referring to length of haul of pulp wood and principal source of supply of wood consumed.

It was suggested that Douglas fir be added to the grade classification Kind of Wood.

It was further recommended that the items taken from the paper census form be included in the wood pulp census form.

D. A. Crocker, secretary of the Woodlands Association, was appointed a Committee of One to confer with the Department of Forestry and the Department of the Census regarding changes in the pulp wood census form.

A committee was appointed to help compile new census report



Link-Belt Sprockets from STOCK

PERFECTLY fitting sprocket wheels, designed correctly to fit chains of standard pitch, are always available from complete Link-Belt stocks, at Chicago and Philadelphia, on an immediate delivery basis.

From foundry to final inspection, Link-Belt sprocket wheels are made to insure lasting service. They are bored as ordered, and key seated or set screwed as required.

See that your sprockets bear the famous Link-Belt trade >——< mark—a surety of service and quality.

Send for our Sprocket Wheel Stock List.

3114

LINK-BELT COMPANY

Leading Manufacturers of Elevating, Conveying, and Power Transmission Chains and Machinery

CHICAGO, 300 W. Pershing Road — INDIANAPOLIS, 200 S. Belmont Ave. — PHILADELPHIA, 2045 Hunting Park Ave.

Ashland, Ky. . . . . 100 W. Winchester Ave.
V. P. Dalmas & Co., 511 Haas-Howell Bldg.
Atlanta . . . . 239 Brown-Marx Bldg.
Birmingham, Ala. . . 1103-4 Statler Bldg.
Boston . . . . .
Buffalo . . . . . 554 Ellicott Square
Cleveland . . . . 537 Rockefeller Bldg.
Denver . . . . . 520 Boston Bldg.
Detroit . . . . . 8633 Lisdale Ave.
Huntington, W. Va., Robson-Prichard Bldg.
Kansas City, Mo., R. 436, 1002 Baltimore Ave.
Louisville, Ky. . . . 340 Starks Bldg.
Minneapolis, Minn. . . . . Link Belt Supply Co., 418 S. Third St.
New Orleans, 504 New Orleans Bank Bldg.
New York . . . . 2676 Woolworth Bldg.
Pittsburgh . . . . . 335 Fifth Ave.
St. Louis . . . . . 3638 Olive St.
Wilkes-Barre, 536 Second National Bank Bldg.

H. W. CALDWELL & SON CO.:—Chicago, Western Ave., 17th and 18th Sts.; Dallas, Texas, 1221 Mercantile Bank Bldg.; New York, 2676 Woolworth Bldg.

LINK-BELT MEESE & GOTTFRIED CO.:—San Francisco, 19th and Harrison Sts.; Los Angeles, 361-369 S. Anderson St.; Seattle, 820 First Ave., S. Portland, Ore., 67 Front St.; Oakland, Calif., 536 Third St.

In Canada—LINK-BELT LIMITED—Toronto and Montreal.

LINK-BELT SPROCKETS

forms for paper and paper board, wood pulp and pulp wood and converted papers.

Mr. A. H. O. Rolle of the Department of Commerce very kindly offered to draw up tentative forms for this committee as a basis for suggestions and changes.

The committee appointed consists of M. C. Dobrow, B. J. Raeber, H. C. Scott, P. S. Hanway.

It was suggested that in addition to the biennial census of pulp, paper and paper products, and converted papers, a brief census of production, etc., schedules be made so that there would be an annual census of production and capacities for these three industries.

It was suggested that Card Board be added as a separate classification in the paper census under the classification Boards.

The committee originally appointed for converted paper reports was instructed to continue to develop a form of census which would be satisfacotry to the Department of Commerce and the industry, for converted papers.

Such converted papers would include: Coated Book Paper, Glazed and Fancy, Waterproof Wrapping, Converted Toilet Paper, Waxed, Gummed, Kraft and Other Bags, Paper Boxes, etc.

The next subject under discussion was the report forms of the American Paper and Pulp Association.

It was suggested that finished weights and not machine weights, be used in estimating tonnage for production. It was also suggested that the billing weight or theoretical weight be used for shipments and that pulps be reported on an air dry weight basis.

It was discussed and recommended that the Association's reports be confined as largely as possible in classification relationship to the reports of the various group Associations and it was further suggested that the practical production capacity be used as a basis for all reports to the American Paper and Pulp Association in the Monthly Summary of Paper and Wood Pulp.

No further general meeting of the Committee was planned, but Mr. Hanway was appointed to head a committee which he would select, to confer with the authorities of the Department of Commerce concerning final acceptance of the suggestions for changes in the Census forms.

The following members of the committee were present: A. H. O. Rolle, Department of Commerce; Mortimer B. Lane, Editor, Survey of Current Business; G. A. Ware, News Print Service Bureau; B. J. Raeber, Paper Board Industries Association; D. A. Wilcox, Oxford Paper Company; J. A. C. Kavanagh, American Paper and Pulp Association; George D. Bearc, News Print Service Bureau; W. S. Housman, International Paper Company; T. J. Burke, Cost Association of the Paper Industry; Stanley Byron, Hammermill Paper Company; M. C. Dobrow, Writing Paper Manufacturers Association; H. C. Scott, International Paper Company; C. E. Dobson, Southern Kraft Manufacturers Association; D. A. Crocker, American Paper and Pulp Association; P. S. Hanway, American Paper and Pulp Association; C. B. Morgan, S. D. Warren Company.

Changes at White & Wyckoff Co. Plant

HOLYOKE, Mass., May 31, 1927.—The following self-explanatory notice was posted the past week in the White & Wyckoff Company plant:

On June 1st Henry J. Toepfert, who has been connected with the company for thirty years, the last five of which as Superintendent of Manufacture, will take over larger executive responsibilities in connection with his recent election as a director, in charge of manufacturing, and vice-president of the company. His successor as superintendent will be Ben L. Wilson, who has been doing special work with the company for the past six months. Mr. Wilson has had industrial engineering experience as a staff member of the C. L. Stevens Company, Engineers of Boston.

Papermakers Brotherhood Arranging Wage Schedules

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., May 31, 1927.—William R. Smith, president of the International Brotherhood of Papermakers, is back at union headquarters in this city after a month's absence during which time he visited paper manufacturing concerns in the Middle West and Canada and negotiated many new wage and working agreements for the coming year. While adjustments has been effected with most of the mills working under agreements with the Brotherhood it became known that there are still one or two firms that have not signed new agreements although the old agreements expires early this month in most cases.

The Brotherhood has sent a communication to the St. Regis Paper Company asking that the firm fix a time and place for a conference looking to the adoption of a new agreement but, according to President Smith, no reply has yet been received from the company. The Brotherhood president does not consider the delay surprising as he said he understood that several of the company officials are absent at the present time and he feels that this is the reason why the company has delayed reply ing to the union communication.

There is also a conference pending with the Unity Paper Company, of Potsdam. At this writing no date has been fixed for this conference. Frank P. Barry, vice president of the Brotherhood, some time during the present week will make a trip to Howland, Me., for a conference with the Advance Bag and Paper Company at which it is expected a new agreement will be adopted covering wages and working conditions during the next year.

President Smith is well satisfied with the new agreements arranged with the various mills during his travels and while some of the wage adjustments did not measure up to what the men expected, he said the agreements are nevertheless gains for the men either in wages or working conditions.

The organization work of the Brotherhood at the present time is being confined for the most part to the Province of Quebec where two new local unions have been formed during the past few weeks. Word reached headquarters this week that the last local union to be organized in Quebec is located at River Bend. Arthur Huggins, vice president, is in charge of the organization work in Canada.

Boston Paper Market Steady

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 31, 1927.—The paper market has been quiet but fairly steady during the week under review. Prices have held firm. Some are ascribing the slowness to the rainy weather which has prevailed. No indication of weakness in paper and box board is noted although since May 15 there has not been so much activity. There has not been any inclination to cut prices in order to force business. It is believed that within a month, however, trade will increase, as the stock in the hands of the customers is comparatively low in box board and papers.

Paper stock as a whole, has remained fairly quiet. Solid ledger stock is quotable at $2.25 f.o.b. Boston and No. 1 mixed paper is at 47½ to 52½, cents. One house received an offer of $11.50 a ton for folded news, with the freight paid, but the owner of the property is not willing to take the order for less than $10 from the point of origin. The freight would cost $2 a ton.

Prices of bagging seem to tend downward, especally in gunny. A further decline is expected in that commodity. Gunny bagging No. 1, foreign, is now quotable at $1.50 to $1.60, f.o.b. Boston compared with the previous range of $1.50 to $1.75. The domestic gunny bagging No. 1 is quotable also at $1.50 to $1.60. Domestic manila rope is quotable at $4 to $4.37½ compared with a previous price of $4.50. In mixed rope, heavy wool tares are quoted at $1.40 to $1.60 compared with a former range of $1.50 to $1.55, and mixed strings at 90 cents to $1.05 compared with $1 to $1.10.

OUR NEW GEAR BOOK

Contains many pages similar to this. It gives dimensions, power capacities, weights, prices and much valuable information for calculating gear sizes. We are glad to send a copy on request.

SIZE D6

FARREL-SYKES HERRINGBONE GEARS WITH CONTINUOUS TEETH

Our designs of enclosed units for reducing speed are a great improvement on other types. The units are all self-lubricating, oil-tight, dust-proof, and thoroughly reliable. More important still, they contain Sykes continuous herringbone gears (as illustrated above) which transmit loads smoothly and silently. The efficiency of these gears has been shown by recent tests to be between 98.9 and 99.4%. This page deals particularly with our D-6 unit which is very suitable for agitator and conveyor drives. In addition, we have about sixty different sizes which cover every kind of power drive which may be required.

Preserve this page in your files. It will be useful to your Maintenance Department.

HORSE POWER CAPACITIES

The table below gives horse power capacities with a liberal factor of safety for uniform loads and continuous service. We have extensive experience in the design and application of these units and it will pay you to consult us on your power transmission problems.

	RATIO						
	10/1	15/1	20/1	25/1	30/1	35/1	40/1
R.P.M.	HORSE POWER						
300	9	6	4.5	3.6	3		
500	15	10	7.5	6	5	4.3	3.75
600	18	12	9	7.2	6	5.1	4.5
720	21.6	14.4	10.8	8.6	7.2	6.2	5.4
900	27	18	13.5	10.8	9	7.7	6.75
1200	36	24	18	14.4	12	10.2	9
1800		36	27	21.6	18	15.4	13.5

Any desired ratio between 10/1 and 40/1 can be supplied. For intermediate ratios and speeds not shown the horse power rating may be obtained from the formula:—HP=.3 x R. P. M. of slow speed shaft.

FARREL FOUNDRY & MACHINE CO., Buffalo, N. Y.

AND ANSONIA, CONN.

New York, N. Y. — 79 Wall St.
Boston, Mass. — 914 Little Bldg.
Cleveland, Ohio — 802 Swetland Bldg.
Pittsburgh, Pa. — 649 Union Trust Bldg.
Havana, Cuba
San Juan, Porto Rico
Edifico, Canada

Committees of American Pulp & Paper Association

The American Paper and Pulp Association, one of the oldest trade associations of the United States, has been particularly effective in taking the guess work out of the paper industry. The PAPER TRADE JOURNAL takes pleasure in listing below the committees of the Association as these indicate the scope of the parent association's activities and the caliber of the men who are carrying on its work in the interests of the pulp and paper manufacturers and converters of the U. S.

AMERICAN PAPER AND PULP ASSOCIATION LISTS OF COMMITTEES

I. EXECUTIVE COMMITTEE, ADVISORY COUNCIL AND STAFF

Executive Committee

President, D. C. Everest, Marathon Paper Mills Co.
Vice-President, S. L. Willson, American Writing Paper Co.
Vice-President, Felix Pagenstecher, Bryant Paper Co.

W. L. Carter	Nashua Gummed & Coated Paper Co.
Hugh J. Chisholm	Oxford Paper Company
J. P. Hummel,	Hummel Ross Fibre Corporation
Milton E. Marcuse	Bedford Pulp and Paper Co.
Norman W. Wilson	Hammermill Paper Company

Advisory Council

Past Presidents

A. C. Hastings	Cliff Paper Company
Geo. W. Knowlton	Knowlton Brothers
A. B. Daniels	L. L. Brown Paper Co.
Geo. W. Sisson, Jr.	Racquette River Paper Co.
Walter J. Raybold	B. D. Rising Paper Co.
Henry W. Stokes	York Haven Paper Co.
Norman W. Wilson	Hammermill Paper Co.

Presidents of Affiliated Associations

Fred J. Rooney	American Pulp & Paper Mill Superintendents' Association
Arthur Havemeyer	American Waxed Paper Association
Leigh H. Davey	Binders Board Mfrs. Association
Donald Lowe	Cardboard Manufacturers Association
J. H. Kline	Cost Assn. of the Paper Industry
Minor M. Beckett	Cover Paper Mfrs. Association
R. N. Fowler	Glazed & Fancy Paper Mfrs. Assn.
Irving McHenry	Natl. Assn. of Gummed Tape Mfrs.
J. H. Coy	Salesmen's Assn. of the Paper Industry
E. C. Tucker	Technical Assn. of the Pulp and Paper Industry
Z. W. Ranck	Tissue Paper Mfrs. Association
L. M. Alexander	U. S. Pulp Producers Association
Henry W. Stokes	Wrapping Paper Mfrs. Service Bureau
Winthrop M. Crane, Jr.	Writing Paper Mfrs. Association

Staff

Executive Secretary —Hugh P. Baker
Assistant Secretary —O. M. Porter
Forester —D. A. Crocker
Statistician —P. S. Hanway

II. STANDING COMMITTEES

A. ACTIVE

Membership

Wm. F. Bromley	Hammermill Paper Company
J. M. Conway	Hoberg Paper & Fibre Co.
P. H. Glatfelter	P. H. Glatfelter Co.
Geo. S. Holmes	Brown Paper Mill Co.
R. T. Houk	Mead Pulp and Paper Co.
I. J. Marcuse	Bedford Pulp and Paper Co.
W. J. Pilz	Everett Pulp and Paper Co.

Tariff

Milton E. Marcuse, Chairman,	Bedford Pulp and Paper Co.
Hugh J. Chisholm	Oxford Paper Co.
A. D. Coffin	C. H. Dexter & Sons
Geo. E. Nelson	West Virginia Pulp and Paper Co.
Reuben B. Robertson	The Champion Fibre Company
Chas. A. Upson	The Upson Company
Norman W. Wilson	Hammermill Paper Company

Conference Committee

American Paper and Pulp Association

and

Canadian Pulp and Paper Association

Canadian Committee

L. R. Wilson, President,	Canadian Pulp and Paper Association
J. Leonard Apedaile	Price Bros. & Co., Ltd.
Edward Beck, Secretary,	Canadian Pulp and Paper Association
K. S. Maclachlan	Lincoln Pulp & Paper Co., Ltd.
John H. Price	Price Bros. & Co., Ltd.
F. G. Robinson	Riordon Sales Corporation
C. Howard Smith	Howard Smith Paper Mills, Ltd.
I. H. Weldon	Provincial Paper Mills, Ltd.
P. B. Wilson	Spanish River Pulp & Paper Mills, Ltd.

American Committee

D. C. Everest, President,	American Paper and Pulp Association
Hugh J. Chisholm	Oxford Paper Company
C. A. Crocker	Crocker-McElwain Company
David L. Luke	West Virginia Pulp and Paper Co.
Edgar Rickard	Pejepscot Paper Company
Norman W. Wilson	Hammermill Paper Company
Hugh P. Baker, Exec. Sec.,	American Paper and Pulp Association

Stream Purification

Harry E. Fletcher, Chairman,	Fletcher Paper Company
C. M. Baker, Chief Engineer,	Wisconsin State Board of Health
Minor M. Beckett	Beckett Paper Company
H. P. Carruth	Mead Pulp and Paper Company
S. B. Copeland	Eastern Mfg. Co.
F. P. Klund	Hammermill Paper Company
W. G. MacNaughton	Technical Assn. of the Pulp & Paper Industry
Ernst Mahler	Kimberly-Clark Company
Felix Pagenstecher	Bryant Paper Company
Edward D. Rich, Director,	Bureau of Engineering, Mich. Dept. Health
George K. Spence	New York & Pennsylvania Co.
W. L. Stevenson, Chief	Engineer, Sanitary Water Board of Pennsylvania
Guy Waldo	Flambeau Paper Co.
F. H. Waring	Ohio State Board of Health
George E. Williamson	Strathmore Paper Co.
Abel Wolman, Chief Engineer,	Maryland State Dept. of Health

Statistical Procedure for the Paper Industry

C. B. Morgan, Chairman,	S. D. Warren Co.
Stanley Bryon	Hammermill Paper Co.
Grellet Collins	Dill and Collins Company
D. A. Crocker	Woodlands Section, Am. Paper & Pulp Assn.
T. J. Burke	Cost Assn. of the Paper Industry
M. C. Warwick	Am. Waxed Paper Assn., Nat'l Assn. Gummed Tape Manufacturers
O. M. Porter	Binders Board Mrfs. Assn., Glazed & Fancy Paper Mfrs. Assn.

Appleton Felts and Jackets

In 1896 when Marconi established the first principles of modern radio.

When Marconi established the first principles of modern radio—back in 1896—Appleton Felts and Jackets were preferred by paper mills throughout America. Since that time they have been in constant use, with the same general acceptance now as then.

For 36 years Appleton Woolen Mills have been making felts and jackets that for quality and service have become the standard. Durability and adaptability that only a high grade wool can produce are the outstanding reasons of a product made with a plant control that checks every detail of manufacture. Accuracy, design, finish, attention to detail, service are other reasons for the wide acceptance of Appleton Felts.

Let us show you what we mean by quality and service on your felt requirements.

APPLETON WOOLEN MILLS
APPLETON, WISCONSIN

QUALITY SERVICE

Henry A. Dickie	Paperboard Industries Assn.
M. C. Dobrow	Writing Paper Mfrs. Association
C. E. Dobson	Southern Kraft Mfrs. Association
J. R. Hinkson	Hampden Glazed Paper & Card Co.
Dr. E. O. Merchant	G. H. Mead Co.
W. H. Savery	Shenandoah Pulp Company
Henry D. Schmidt	Schmidt & Ault Paper Co.
H. C. Scott	International Paper Co.
G. A. Ware	Newsprint Service Bureau
Grafton Whiting	Paperboard Industries Assn.
D. A. Wilcox	Oxford Paper Company
P. S. Hanway, Secretary,	American Paper & Pulp Association

Classification of Paper

R. F. McElwain, Chairman,	Crocker McElwain Company
W. L. Carter	Nashua Gummed & Coated Paper Co.
W. G. MacNaughton	Technical Assn. of the Pulp & Paper Industry
Dr. E. O. Reed	Office of Public Printer
B. W. Scribner	Paper Section, Bureau of Standards
Clarence J. West	National Research Council
P. S. Hanway	American Paper & Pulp Association

Carton Packaging

Kimberly Stuart, Chairman,	Neenah Paper Company
Charles Addoms	Miller & Wright Paper Co.
Leon Beck	Chas. Beck Paper Co.
E. F. Fletcher	Hammermill Paper Co.
B. A. Franklin	Strathmore Paper Co.
W. N. Gillett	Chicago Paper Co.
Forest Hopkins	Paper Mills Co.
A. W. Leslie	John Leslie Paper Co.
Albert Luhrs	Container Testing Laboratories
R. F. McElwain	Crocker-McElwain Co.
Irving McHenry	Mid-States Gummed Paper Co.
W. C. McLaughlin	Union Paper & Twine Co.
E. H. Naylor	Writing Paper Mfrs. Assn.
Z. W. Ranck	Crystal Tissue Co.
N. A. Schoenbucher	Wrap. Paper Div., Nat'l Paper Trade Assn.
A. J. Stewartson	Wrapping Paper Mfrs. Service Bureau
S. L. Willson	American Writing Paper Co.

Simplification and Standardization

S. L. Willson, Chairman,	American Writing Paper Co.
Allen Curtis	International Paper Co.
H. W. Ellerson	Albemarle Paper Mfg. Co.
B. A. Franklin	Strathmore Paper Co.
Alex G. Gilman	Allied Paper Mills
Charles A. Gordon	Oxford Paper Company
R. F. McElwain	Crocker-McElwain Co.
E. H. Naylor	Writing Paper Mfrs. Association

New Uses of Paper

W. L. Carter, Chairman,	Nashua Gummed & Coated Paper Co.
L. C. Anderson	W. B. Oglesby Paper Co.
Grellet Collins	Dill and Collins Co.
Albert R. Smith	Keith Paper Company
Chas. A. Upson	The Upson Company

Distribution

C. W. Chabot, Chairman,	Hammermill Paper Co.
J. L. Fearing	International Paper Co.
Felix Pagenstecher	Bryant Paper Co.

Sub-Committee, National Committee on Wood Utilization

Reuben B. Robertson, Chairman, Champion Fibre Company

John E. Alexander	Nekoosa-Edwards Paper Co.
Amor Hollingsworth	Tileston & Hollingsworth
R. T. Houk, Sr.	Mead Pulp and Paper Co.
E. W. Kiefer	Port Huron Sulphite & Paper Co.
Norman W. Wilson	Hammermill Paper Co.

B. ADVISORY

Advisory Committee on Transportation Legislation

A. H. Campbell, Chairman,	International Paper Co.
M. M. Davis	Hammermill Paper Co.
C. C. Furgason	West Virginia Pulp and Paper Co.
H. B. Mills	Oxford Paper Co.
J. J. Seid	Crown Willamette Paper Co.

Taxation

Eugene W. Fry, Chairman,	Jessup & Moore Paper Co. (Book)
Jos. E. Holmes	Crocker-McElwain Co. (Fine)
M. E. Marcuse	Bedford Pulp & Paper Co. (Wrapping)
Frank L. Stevens	Stevens & Thompson Pa. Co (Tissue)

U. S. Dept. of Agriculture

Geo. W. Sisson, Jr., Chairman,	Racquette River Paper Co.
F. E. Bragg	Orono Pulp and Paper Co.
Grellet Collins	Dill and Collins Co.
D. C. Everest	Marathon Paper Mills Co.
H. E. Fletcher	Fletcher Paper Co.
A. C. Goodyear	Bogalusa Paper Co.
N. C. Head	International Paper Co.
Charles Luke	West Virginia Pulp and Paper Co.
Geo. Ostrander	Finch, Pruyn & Co.
Reuben B. Robertson	Champion Fibre Co.

U. S. Dept. of Commerce

Norman W. Wilson, Chairman,	Hammermill Paper Co.
W. L. Carter	Nashua Gummed & Coated Paper Co.
Hugh J. Chisholm	Oxford Paper Co.
H. W. Ellerson	Albemarle Paper Mfg. Co.
David L. Luke	West Virginia Pulp and Paper Co.
Milton E. Marcuse	Bedford Pulp and Paper Co.
R. F. McElwain	Crocker-McElwain Co.
C. R. McMillen	Union Bag & Paper Corp.
Felix Pagenstecher	Bryant Paper Co.
Frank L. Stevens	Stevens & Thompson Paper Co.

U. S. Bureau of Standards

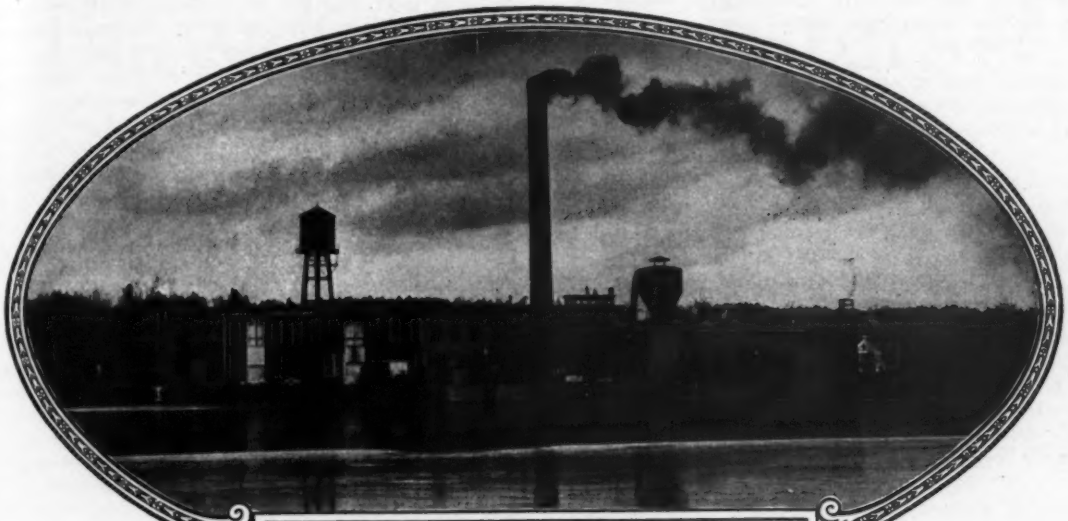
Ernst Mahler, Chairman,	Kimberly-Clark Co.
Fred C. Clark	East Hartford Mfg. Co.
Dr. Bjarne Johnsen	Hammermill Paper Co.
W. G. MacNaughton	Technical Assn. of the Pulp & Paper Industry
Arthur H. Nevius	Oxford Miami Paper Co.
G. R. Wadleigh	West Virginia Pulp and Paper Co.
Geo. W. Wheelwright	Geo. W. Wheelwright Paper Co.
S. L. Willson	American Writing Paper Co.

Joint Committee Approved Pulp Testing Chemists

S. Goldman, Chairman,	English China Clays Sales Corp.
W. G. MacNaughton	Technical Assn. of the Pulp & Paper Industry
O. M. Porter, Secretary,	American Paper and Pulp Associatoin

Paper and Pulp Committee, Atlantic States Shippers Advisory Board

O. M. Porter, Secretary,	American Paper and Pulp Association
H. F. Masman, Vice-Chairman,	Nat'l Assn. of Waste Material Dealers
W. J. Mathey, Vice Chairman,	American Nawspaper Publishers Assn.
Stuart H. Brown	Union Bag & Paper Corp.
A. H. Campbell	International Paper Co.
C. C. Furgason	West Virginia Pulp and Paper Co.
J. S. Gill	The Upson Company
D. G. Kibbey	A. P. W. Paper Co.
Geo. Lucas	National Publishers Association
C. J. McIntyre	Dill and Collins Co.
Joseph A. Quinlan	St. Regis Paper Co.



HOLLINGSWORTH & VOSE COMPANY
West Groton, Mass.

Another Hollingsworth & Vose mill enjoys the advantages of E B G Liquid Chlorine

THE West Groton Mill of the Hollingsworth & Vose Company observed that time and labor wastes were abolished, and bleaching production improved, when Liquid Chlorine was installed in the East Walpole Mill of this company, so it was natural that they should utilize in all their mills Liquid Chlorine, the chemical that has revolutionized paper bleaching.

The adoption of Liquid Chlorine by this mill was another accession to the idea that the bleaching process is simplified and improved by Liquid Chlorine.

Single-unit tank cars holding approximately 30,000 pounds, and multi-unit tank cars consisting of 15 one-ton containers, offer the large user of E B G Liquid Chlorine every possible advantage.

SINGLE-UNIT TANK CAR

MULTI-UNIT TANK CAR

E B G SERVICE

Includes abundant production facilities and container equipment, of course; expert engineering counsel in the use of Liquid Chlorine which would naturally be expected of the pioneer manufacturer. But beyond these a service which is much more comprehensive than the usual conception. Investigation will reveal the significance of this.

EBG

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Plant: NIAGARA FALLS, N.Y.

Main office 9 East 41ST Street New York.

New York Trade Jottings

G. A. Ware, of the News Print Service Bureau, New York, is inspecting the Lake States paper mills.

* * *

Arthur Simon, formerly of the Majestic Mills Paper Company, is now conducting his own business at 246 Fifth avenue, New York, and is specializing in writing and printing papers.

* * *

The committee on stock list of the New York Stock Exchange, at a meeting last week admitted to trading 500,000 shares of common stock without par of the International Paper Company.

* * *

Elbert H. Baker, of Cleveland, chairman of the Committee of Conservation of National Forest Resources of the American Newspaper Publishers, spent several days in New York last week.

* * *

Harry Z. Hyman, of L. Hyman & Sons, paper merchants, 35 West Houston street, New York, plans to visit the tissue and paper mills around Phoenix and Fulton, N. Y., during the week of June 6.

* * *

Alexander M. Koroleff, recently appointed technical secretary of the Woodlands Section of the Canadian Pulp and Paper Association, spent a few days in New York last week prior to beginning his new duties on June 1.

* * *

The directors of the General Electric Company, at their meeting in New York on May 25, increased the regular quarterly dividend from 75 cents to $1 per share, and, in lieu of the annual dividend of $1 per share from surplus heretofore paid in special stock, the directors substituted $1 per share in cash.

* * *

Among the visitors at the American Paper and Pulp Association's offices recently were Henry W. Stokes, past president of the association, and Miron J. Scheskin, an experienced Polish card-board manufacturer who is seeking employment in mills manufacturing leather board, press board or other grades of board.

* * *

Dr. Werner Neovius, director of the Finnish Cellulose Association in charge of the pulp testing laboratory at Helsingfors, Finland, left for his home Wednesday, May 25, after having spent two months in the United States. During his stay here Dr. Neovius visited a great many paper mills, many of which use Finnish pulp; and also inspected a number of paper mill laboratories, as well as the United States Forest Products Laboratory at Madison, Wis.

* * *

The next meeting of the American Waxed Paper Association, to be held at the Hotel Commodore, New York, on Wednesday, June 8, will be given over to the discussion of Costs, under the leadership of R. A. Hayward, general manager of the Kalamazoo Vegetable Parchment Company who is chairman of the Cost Committee. This committee, which also includes R. B. Donnelley, of the Central Waxed Paper Company, of Chicago, and Oscar L. Tacy, of the Nashua Gummed and Coated Paper Company, is making an intensive study of the subject and the analysis and discussion to follow should be of great interest.

Boston Discontinues 1000 Sheet Plan

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., May 31, 1927.—Wholesale paper houses here are to send out individual notices that they are giving up the thousand-sheet plan and return to the package method of merchandising.

Bureau of Standards Tests Bags

WASHINGTON, D. C., May 31, 1927.—The improvement in the quality of paper bags and the development of the multiple-wall type have led during recent years to a continually increasing use of such containers for shipping powdered materials by freight. This has directed considerable attention to the requirements for paper bags in the Consolidated Freight Classification.

The Bureau of Standards, at the request of and in cooperation with a paper bag manufacturer, has just completed a series of tests on the relative strength of single-wall and double-wall bags. This was in connection with section 10, rule 40, of the Consolidated Freight Classification which requires that a multiple-wall bag shall contain a greater total weight of paper than a single-wall bag, when the two types of bags are used for a similar purpose.

Two sets of satchel-bottom, pasted kraft bags were used in making the comparison. A one-eighth-barrel bag made of a single layer of 100-pound paper was compared for strength with a one-eighth-barrel bag composed of two sheets of 50-pound kraft paper. A similar comparison was made between a one-fourth-barrel bag made of two layers of 60-pound paper and a one-fourth-barrel bag made of one sheet of 120-pound paper.

The test adopted was repeated dropping, two types of such test being used—the side drop and the end drop. The side drop was a 4-foot drop with the bag in a horizontal position. The end drop was a 2-foot drop, the bag being placed in a vertical position with the tied end uppermost. In both types the bag was filled with 25 or 50 pounds of flour, according to its capacity. The apparatus used for dropping the bag was a double trapdoor of adjustable height. The release of two sets of sliding bolts caused the bags to fall to a cement floor. This was repeated until the bags were broken. The bursting strength and weight of the paper composing the bags were determined and taken into account in comparing the results obtained.

When subjected to the dropping test, which is generally considered to simulate best the service strains to which bags are subjected, the double-wall bags showed from 18 to 100 per cent greater resistance to the dropping impact than a single-wall bags. These tests show conclusively that double-wall bags are stronger than single-wall bags when the two are of the same type and of the same weight of paper.

A report giving these findings was submitted to the Official Freight Classification Board relative to proposed revision of the section of the Consolidated Freight Classification mentioned. The revised section would permit equal weights of paper for single-wall and double-wall bags.

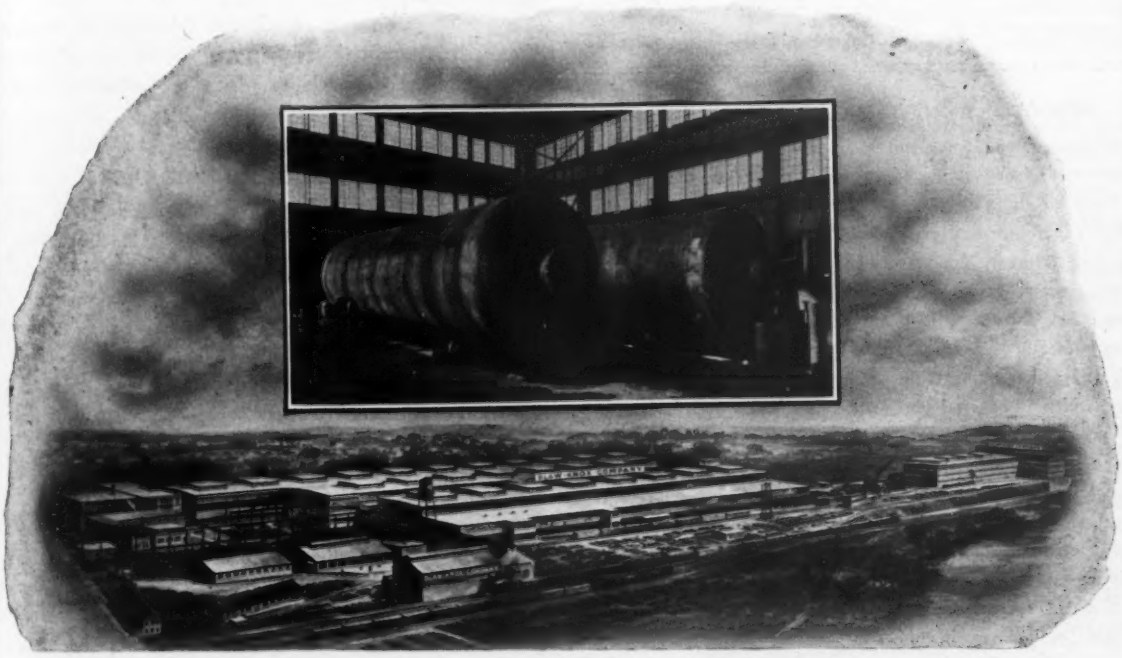
The experience obtained in this work indicates that the chief factors in the serviceability of freight-container paper bags are, in addition to the strength of the paper, the relative dimensions of the two sides of the bags, the amount of space remaining in the bags after they are filled, and the manner of closing the bottom seams or folds. Additional experimentation on these factors, including the various types of bags as regards both construction and kind of paper, would no doubt lead to information of value, both in more adequately classifying the bags and increasing their serviceability.

Binders Board Manufacturers Meet in Monroe

The following members of the Binders Board Manufacturers Association attended a regular meeting of the Association held in the offices of the Consolidated Paper Company, at Monroe, Mich., on May 27: E. C. Betz, Consolidated Paper Company; John A. Dodd, The Davey Company; E. Davey Dodd, The Davey Company; Edward Kerr, Jr., Kerr Paper Mill Company; E. H. Norton, C. H. Norton Company; H. V. Daub, Otter River Board Company; A. B. Goodrich, Riverside Paper Manufacturing Company; H. McDaniel, Waldorf Paper Products Company and O. M. Porter, secretary of the association.

Blaw-Knox Digesters—

from the most modern Forge & Hammer Welding Plant in the world



Blaw-Knox Digesters, built in the Forge and Hammer Welding plant of the Blaw-Knox Company, are designed by engineers experienced in designing vessels for the paper industry. Exclusive machinery, modern plant layout, most improved methods, together with long experience in rigid shop practice, insure superior results. One-piece annealing is one of the latest requirements exclusive in the Blaw-Knox plant.

A long list of Forge and Hammer Welded Digesters in service—(none of which has ever failed) . . .

The most modern Forge and Hammer Welding plant in the world . . .

These are what Blaw-Knox Company can offer you.

We shall be glad to furnish quotations on stationary, rotary, and tumbling Digesters.

BLAW-KNOX COMPANY
638 FARMERS BANK BLDG., PITTSBURGH, PA.

NEW YORK CHICAGO BALTIMORE BUFFALO BIRMINGHAM CLEVELAND DETROIT PHILADELPHIA

BLAW-KNOX

WP-2959

PAPER TRADE JOURNAL
ESTABLISHED 1872
With Which Is Combined
[redacted]
The Magazine of the Paper Industry
HENRY J. BERGER, Editor

Member A. B. C. Audit Bureau of Circulations

Vol. LXXXIV New York, June 2, 1927 No. 22

DIRECTORY INFORMATION WANTED

Questionnaires are being sent out for the new edition of Lockwood's Directory of the Paper and Allied Trades to be published early in the fall. The request for information for the Directory usually brings early responses so far as most individuals and firms are concerned, but each year still finds altogether too large a number who are inclined to procrastinate. This is wrong. The publishers do their best to meet any contingencies that may arise through carelessness in preparing information or through delays in sending it in, but it should be remembered that accuracy, which is of vital importance in a work of this kind, is greatly promoted by carefully prepared replies sent in at the earliest possible moment.

Although the publishers have in the past, endeavored to make plain just what should be listed in the various sections of the Directory, misunderstandings unfortunately continue to exist. For this reason, it seems advisable to state again at this time the purposes of the several sections.

The Mill Section contains the data only of plants having pulp and paper making machinery; the Classified Section is a summary of the products mentioned in the report in the Mill Section; the Specialties Section contains the names of representative paper converters; and the Water Marks and Brand Section contains the names of owners only of water marks and brands, and does not list the names of distributors of these water marks and brands.

The purpose of other sections of the Directory is so obvious that any additional explanation does not seem necessary. In general, however, it should be remembered that only concerns, who are eligible to the various sections will be listed in these sections. This means specifically that only concerns having paper making machinery will be listed in the Mill Section and only such concerns will be listed in the Classified Section, that only actual converters of paper and not jobbers of such goods, will be listed in the Specialties Section, and that only owners of water marks and brands will be listed in the Water Mark and Brand Section.

Of late, due undoubtedly to the growing importance of this department, misunderstandings have arisen regarding the purpose of the Specialties Department. It was the original purpose of this department to furnish to paper manufacturers the names of possible consumers of their products. It was naturally intended to make this list as large as possible, but it was never pretended that it was a complete list. This obviously would be too difficult to attempt, as many of these converters have no connection with the paper trade beyond the fact that they are consumers of paper.

In the course of time the Specialties Department has come to answer the purpose, not only of furnishing the paper manufacturers with valuable hints as to possible customers, but it has come also to be appreciated by the general paper merchants and others as a valuable source of information regarding the manufacturers of a wide variety of paper goods. For both these reasons, therefore, the publishers of Lockwood's Directory will be very glad to print the names of as many additional firms making paper specialties as they can obtain.

The publishers urgently request that the questionnaires for the Directory be returned as early as possible and that they be made out carefully and accurately by some person competent to do the work.

SULPHITE COOKING COURSES

The courses in sulphite cooking which were given early in 1927 at the Forest Products Laboratory, at Madison, Wis., are again planned for December of this year and members of this industry are urged to avail themselves of the opportunity of becoming familiar with the knowledge and experience acquired by the Laboratory during the past ten years of intensive study of the subject.

As in the preceding courses the enrollment will be strictly limited to fifteen men, anyone planning to attend should make reservation at once in order to ensure his attendance.

The two ten-day courses in the cooking and manufacture of sulphite pulp given at the Forest Products Laboratory were especially designed for operating men and linked up the practical and theoretical features of sulphite cooking. One of the important parts of these courses was the series of experimental tests made in the 100 pound digester at the Laboratory. Varying operating conditions were used and the yield and quality of the pulp were determined under a wide range of cooking conditions.

A study of the manufacturing methods and composition of sulphite liquor was made. The concentration of the acid and its other characteristics were taken into consideration as well as their effect on the wood chips. A detailed study was made of the temperatures during the entire cook in the attempt to determine the best method of maintaining quality and yield. Closely allied to the temperature is the pressure, which was given considerable attention. All of the experimental cooks were based on predetermined temperature and pressure curves, together with different strengths of acid. The resultant pulps were tested along standard lines recommended by the Laboratory and comparisons made in order to tie in the experimental cooking conditions with those actually carried on by the men in their own mills.

Another feature was the study of the chemical composition of the pulps produced and an analysis of the chemical action in the production of sulphite pulp. The characteristics of the different species of wood were taken into consideration in the study of these problems. The question of decayed wood was

also taken up and the result of using rotted wood from the standpoint of yield, quality, strength of acid, and other general cooking conditions.

Various miscellaneous problems were considered. The bleaching of various grades of pulp was studied from a standpoint of quality of pulp and bleach consumption. Standard methods of determining results were outlined. The ball mill method of testing sulphite pulp for strength was covered in detail as a general procedure, and also to test the samples of pulp produced during the series of experimental tests. The question of pitch troubles was also discussed.

Another subject of importance was the semi-chemical method of producing pulp. This was also supplemented by a study of the action of the rod mill and the feasibility of using it to hydrate chemical pulp as well as to disintegrate the chips made by the semi-chemical process.

One of the most valuable features of the course was the practical questions that were submitted and discussed by the men taking the course, and nearly every phase of the sulphite manufacturing process was considered. Such questions as the liming of blowpits, size of strainers and drain pipes, the proper strength of acid under certain operating conditions, the problem of outside forced circulation in the digesters and the best way to determine the blow-out point were some of the things that were discussed in detail. Other questions related to the method of cooking such woods as jack pine, the advantages of the side relief method, and the best way of reclaiming acid. Other inquiries covered the maximum cooking temperatures possible under certain conditions, the average consumption of steam, the value of using superheated steam, and the best way to control temperatures in the sulphur burning operation. In fact, the wide variety of practical questions upon almost every phase of sulphite cooking enabled all those taking the course to get both the theoretical and practical viewpoint.

The courses in the Spring were participated in by representatives of the most prominent mills in this country and Canada and the winter courses have promises of being equally successful.

First Unit in Farmers Powerhouse Turned Over

The first unit in the Farmers powerhouse of Gatineau Power Company has been turned over for the purpose of tuning up. The Farmers powerhouse is one of three which Gatineau Power Company is building on the Gatineau River, the others being at Chelsea, a mile upstream, and at Paugan, twenty-seven miles above Farmers.

The Chelsea and Farmers developments are within seven miles of the city of Ottawa. Two units in the Chelsea powerhouse are already operating, and are supplying power to the Gatineau mill of Canadian International Paper Company.

The Farmers powerhouse is designed for five units of 24,000 horsepower each and is operating under a head of sixty-six feet. The total length of the dam at Farmers, including spillway, powerhouse sections, and wing dams, is 4,800 feet, and its maximum height is seventy-five feet.

The Gatineau Power Company, all of the common stock of which is held by International Paper Company, owns water-power sites with an aggregate potential capacity in excess of 700,000 horsepower.

Long term contracts for the sale of electric power have been entered into with the Hydro-Electric Power Commission of Ontario, Canadian International Paper Company, and Canada Cement Company Limited.

Paper Census Changes Recommended

A committee representing the paper industry met on Wednesday to decide on tentative changes for the census of paper, pulp and converted paper industry. The following attended.

A. H. O. Rolle, Department of Commerce;
Mortimer B. Lane, Editor, *Survey of Current Business;*
G. A. Ware, News Print Service Bureau;
B. J. Raeber, Paperboard Industries Association:
D. A. Wilcox, Oxford Paper Company;
J. A. C. Kavanagh, American Paper and Pulp Association;
George D. Bearce, News Print Service Bureau;
W. A. Housman, International Paper Company;
T. J. Burke, Cost Association Paper Industry;
Stanley Byron, Hammermill Paper Company;
M. C. Dobrow, Writing Paper Manufacturers Association;
H. C. Scott, International Paper Company;
O. E. Dobson, Southern Kraft Manufacturers Association;
D. A. Crocker, American Paper and Pulp Association;
P. S. Hanway, American Paper and Pulp Association, and
C. B. Morgan, S. D. Warren Company, Chairman.

Recommendations were made relative to practically every grade of paper being manufactured, with definite suggestions regarding changed forms in statistics, Government reports, Writing Paper, Pulp Association reports, etc. Such recommendations will be submitted in the form of an official recommendation to the Department of Commerce, Bureau of the Census, for further consideration.

Practically every recommendation made was given consideration as to its value in determining better trends of consumption, production, etc., so that the industry may have better statistics in future with less duplication and more value.

Good Progress on I. P. Mill at Camden

[FROM OUR REGULAR CORRESPONDENT]

CAMDEN, Ark., May 31, 1927.—There are more than 400 men employed in the construction of the huge plant of the Southern International Paper Company at Cullendale, two miles south of Camden. Large forces are employed in excavating, pouring concrete, steel work, and laying brick.

The construction work was delayed for a short time by failure to secure materials due to the recent flooded condition of all railroads. However, work is in full swing again and the greater portion of the steel work has been completed.

The concrete work is progressing at a fast rate and the foundation for the main building, which will be four stories high and over 700 feet long, has almost been completed. The laying of brick for this mammoth plant has also started.

Both railroads have completed their sidings into the site, and materials are being delivered on the grounds. A high iron fence has been constructed entirely around the plant which covers approximately 160 acres.

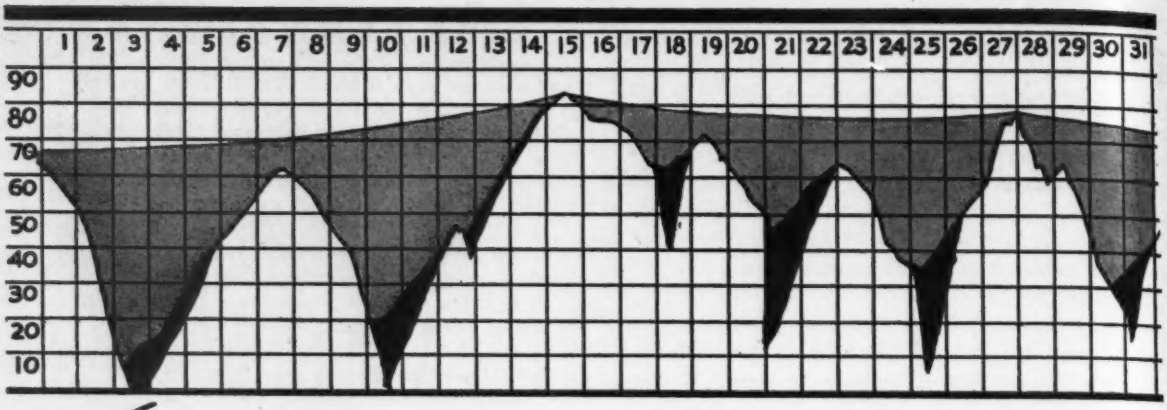
The plant will not be completed and in operation until about the first of January, 1928.

In addition to the 400 men employed on the construction of the paper plant, there are several hundred more at work in Cullendale, building residences and stores in this newly opened business and residential section. This section of Camden has become a veritable hive of activity within the past five months.

Northwestern Pulp Co. Tenders Bond

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., May 20, 1927.—The Northwestern Pulp and Paper Company has tendered to the city council of Astoria the form of bond which the company will give before the city begins the huge water system project for the Young's Bay district. This system is primarily intended to take care of the industrial plants to be started there, among the largest of which will be a pulp and paper mill for the Northwestern Company.



Eliminate the "Valleys" in Production Quality

Rosin Size and Service

The KALBFLEISCH CHEMICALS & SERVICE for PAPER

OFTEN a chart of paper production—from a quality standpoint—would disclose unprofitable dips or "valleys".

In many cases this descent from high standards of production may be traced to the size and the manner in which sizing operations are conducted.

The use of Kalbfleisch Rosin Size and System may be depended upon to maintain sizing results at a profitable level. Kalbfleisch Rosin Size has established an enviable reputation for cleanliness and uniformity; and the helpfulness of the De Cew Sizing System, installed and supervised by Kalbfleisch engineers, likewise is established.

We sincerely believe that it is to your advantage to investigate the possibilities of Kalbfleisch Chemicals and Service for your production.

Ask us to give you the facts.

The KALBFLEISCH *Corporation*

200 Fifth Avenue New York

FACTORIES:

Erie, Pa. Brooklyn, N. Y. Kalamazoo, Mich. Elizabeth, N. J.

Chattanooga, Tenn. De Quincy, La. Waterbury, Conn.

Section of the
Technical Association of the Pulp and Paper Industry

AN ORGANIZATION FOR THE ENCOURAGEMENT OF ORIGINAL INVESTIGATION AND RESEARCH WORK IN MILL ENGINEERING AND THE CHEMISTRY OF PAPER, CELLULOSE AND PAPER-MAKING FIBERS GENERALLY; IT AIMS TO PROVIDE MEANS FOR THE INTERCHANGE OF IDEAS AMONG ITS MEMBERS IN ORDER THAT PROCESSES OF MANUFACTURE MAY BE MADE MORE EFFICIENT AND IMPROVED ALONG TECHNICAL LINES.

Conducted by W.G. MacNAUGHTON, Secretary

The K-B Process*

By H. C. Avery[1],

The history and development from theory to common mill practice of the KB process for the manufacture of asphalt filled board on a paper machine as conducted in several of the largest mills of the country is of interest to paper manufacturers, and others attracted by a novel process.

Five years ago when I first started to discuss the use of asphalt at the wet end of a paper machine my statements were met with open skepticism. That would have been a perfectly reasonable attitude had I been talking asphalt as the public knew it then.

Most of us are so close to our problems that frequently some one who is not, sees things in a new and truer light. That is just what happened here. Mr. Lester Kirschbraun, a chemical engineer specializing on the manufacture and uses of asphalt was not thinking in terms of sticky wires, coated felts and plugged stacks. He had a theory that asphalt properly emulsified would mix with fibers and be felted into board. His theories were so intelligently presented to The Flintkote Company that a working arrangement was entered into whereby the initial experiments could be conducted on one of our paper machines at Rutherford, N. J.

Asphalt Discussed

It might be well at this point to clear up the idea held by almost everyone that all asphalts come from Trinidad; a common idea carried over from our geography days, when we studied a picture of an asphalt lake in Trinidad. Natural asphalts, of which Trinidad is one, carries so much foreign matter that its use is very largely limited to road construction.

Proper asphalts may be bought from any one of several of the largest oil refiners at a cost of about $16 to $20 a ton, which figure is fairly comparable to the price of paper stock. Asphalt specifications are as carefully drawn and adhered to as is the case with lubricating oil or any other paper mill supply.

We do not use tar, which would be objectionable from a point of odor and taste readily transmitted to food products packed in the boxes. Asphalt has neither taste nor odor, is acid and alkali resistant but not grease proof.

The right type of asphalt was found to be one with a melting point of 160-180 degrees Fahr., and a penetration of 12-16 at 77 degrees Fahr. The proper asphalt must not contain any free oils, as these would come through the liners and stain the board. It must have a good bonding quality at normal working temperatures and yet be hard enough to make a stiff board. Such an asphalt can only be obtained by steam refining of a Mexican or California crude.

KB Asphalt Emulsion

Just what is KB asphalt emulsion? It is a self-sustaining rather permanent mixture of asphalt, clay and water in varying proportions approximating four pounds of solids to the gallon and 45 per cent of water, produced through rapid agitation in an emulsifier.

It is interesting to note here that the use of emulsion is not limited to the manufacture of board by any means. A wide variety of products have already been produced and others are being perfected. One manufacturer is selling an imitation linoleum made on a wet machine; another is manufacturing molded products such as pails, tubs, toys, etc., using a mixture of emulsion and pulp sucked onto molds; textile rugs are backed and waterproofed by KB emulsion in substitution for rubber latex and at a great saving in cost; cork used for insulation by several of the prominent household refrigerator manufacturers is protected against the infiltration of moisture by a coating of emulsified asphalt; the walls of commercial refrigerator boxes lined with insulation materials are also protected by a KB mastic; quite the most original and unusual use for asphalt filled paper is that as a paper mulch. Thousands of acres of sugar and pineapples are grown under this type of paper, which kills the weeds, conserves the moisture, maintains more even temperatures and stimulates the growth of the plants. The paper is perforated in such a way as to admit rain, but the tabs close from the bottom like a clapper valve when the weeds start to push their way through.

Proper mixtures of sand and emusion make an ideal mastic mill floor. As a protective coating over steel and other metals there is none better against the destructive forces of rust and corrosion, moisture or acid fumes. Any roof can be either patched, or the life of the entire roof indefinitely prolonged by a proper application of emulsion. In fact, so universal are the uses for emulsion that every mill might well have a supply available as a general patching material.

In appearance KB emulsion is a black buttery paste which is further reduced to the consistency of heavy cream by the addition of more water.

To visualize the structure of emulsion, I will illustrate by comparing it to a dense mass of shucked peanuts in their red jackets floating in water. The extremely small elongated particles of asphalt averaging 1/10,000 of an inch in diameter, are represented by the nut of the peanut. Around each particle of

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.
* See Paper Trade Journal, May 11, 1922.
[1] Member TAPPI. Flintkote Co., New York.

asphalt is a very thin coating of clay likened to the red husk of the peanut. The clay, because of its colloidal properties surrounds the particles of asphalt with a jellylike coating, which acts as a barrier and prevents the asphalt particles from flowing together and fusing. We now have clay coated asphalt particles in a dense mass, passing but not sticking to each other, just as peanuts would do as described.

The asphalt is in the interior phase, as it is called, the clay in the interface and the water in the exterior phase. It is perfectly feasible to place one's hand in the emulsion, then wash off every trace of asphalt with cold water. This remains true so long as water is present and it is this property imparted to asphalt which makes it possible to run it on a paper machine.

How is this done in the mill? A location is chosen which may be any reasonable distance from the wet end but preferably near it and adjacent to incoming tracks. The space required may be as little as 1200-1500 sq. ft. two stories in height, The emulsion can be pumped or blown by compressed air any required distance.

The asphalt is reduced to a liquid in a melting kettle which is heated by steam coils at boiler pressure; this occasions no extra fire hazard from an insurance point of view. Until the asphalt is emulsified it must be maintained at about 300 degrees Fahr. to pump readily through steam jacketed lines. Clay is added to water in proportions of 1.8-2.2 pounds of clay to sufficient water to produce one gallon of slurry, all of which is thoroughly beaten in a standard clay plunger. This clay slurry is then dropped to a horizontal chest and slowly agitated. Both the hot liquid asphalt and the cold clay solution are pumped in cycle to the emulsifier usually located on a floor above. The emulsifier is the only special equipment used in the making of the emulsion. It is a magnified soda fountain mixer of 100 gallon capacity. In the center of the emulsifier is a high speed shaft revolving 1,000 r.p.m. To the bottom of this shaft is fixed two three-bladed propellers exerting a down pull. A draft tube is also provided causing an elliptical travel of the materials which are fed in constant streams into the emulsifier where they unite as an emulsion, which in turn flows continuously from the emulsifier to storage. Only such quantities of asphalt and clay water are drawn from the supply as are required to produce the emulsion in a continuous stream and the surplus raw materials are bypassed back to their source.

The emulsion as it leaves the emulsifier contains about half water and half solids. Since this is too thick for use, an equal volume of cold water is added in the storage tanks, reducing the solids to 2 pounds to the gallon. The finished emulsion is kept under slow agitation and may be used several weeks thereafter without bad effect.

The operator regulates the correct amounts of asphalt and clay water through control valves and the mass temperature is maintained at about 150 degrees Fahr. or about 10 to 15 degrees below the asphalt.

Any intelligent man may be readily trained to operate the emulsifier. With one helper he can charge the mixers and run the entire department.

An emulsifier will handle from a ton to a ton and a half of asphalt an hour. As the asphalt content of KB boxboard averages about 15 per cent of the finished weight for .016 inch board or approximately 16 pounds of asphalt to 1,000 sq. ft. of board of any caliper, one emulsifier will supply a 100-ton machine. Sufficient storage for finished emulsion is provided to permit continuous machine operation for several hours, in case of an interrupted supply.

It is frequently asked: "How hot do you keep the emulsion?" It is kept as cold as the water. The greatest factor of safety lies with very cold clear water or cold emulsion.

It is common practice in the manufacture of wet machine KB board to pump the emulsion direct to the beater just as any other sizing material is added. It is then thoroughly mixed with stock, first raising the roll off the plate. From there on the procedure differs in no way from standard mill practice. A well sized KB wet machine board contains about 30 per cent of asphalt by weight.

The emulsion is supplied to the board machine in a different manner through the use of a coating roll, constructed on the principle of a small dandy roll, which is covered with a 14 or 20 mesh wire. This roll which revolves in a box one foot square is placed between the chosen cylinders, usually the center ones. The box is provided with an overflow which maintains an even level of emulsion.

The emulsion is carried up by the mesh of the wires and is spread on the wet plies of board in the form of a film. The asphalt film is then covered by the plies which follow.

The excess emulsion passes to a sump and from there back to storage. The roll is driven by chain and sprocket from nip rolls through a variable speed drive. The consumption of power is negligible.

The setting of the roll is such as to clear the normal travel of the felt, by about an inch. Deflection of the felt when contact is desired with the coating roll is provided by an adjustable idler roll which works ahead of the coating roll. The instantaneous contact and release of the coating roll has this advantage: the machine tender starts his machine and completes all his adjustments without making asphalt broke. About the only change that he must make is to cut off 2 points of stock at his stuff gate, as the asphalt will bring the board back to regular caliper. In case of any trouble on the machine, the roll can be thrown out of contact and such broke as is made, is free from asphalt. The contact of this roll with the formation, adhering to the felt, is so light that it may be run 15-20 per cent faster than the travel of the machine, thereby obtaining a more even spread of asphalt. An inverted suction box just ahead of the coating roll working on the felt tends to dry the sheet and prevent blowing.

Manufacturing Details

As there is no contact of asphalt to wires or felts, the possibility of trouble from the asphalt is reduced to a minimum at the wet end. The black water couched through the felt is not of sufficient quantity to cause any appreciable discoloration of the white water, and therefore, there is no necessity for a separate reclamation system. The only indication of asphalt as the board passes over the machine, and through the calenders, may be found in a narrow black deckle.

It probably comes to you to ask how can the moisture in the board get out if the center is moisture proof. The reason for this is that so long as there is an appreciable per cent of moisture in the sheet, the particles of asphalt retain their identity, in consequence of which there is free passage of moisture between the asphalt particles. The fusing of the asphalt particles into a continuous film occurs on the last group of driers and is completed by the pressure of the calenders.

Due to the greater density of asphalt to stock there is about 5 per cent less sheetage in the lighter calipers up to 0.022 inch. This can be very largely offset by a somewhat lighter finish, permissible because asphalt filled board takes a higher finish for a given pressure than does ordinary board.

The paper machine broke is furnished to a spuecial beater where it is reduced with the aid of hot water. This broke can be fed to the filler vats without adhering to blanket or wires. The particles, of course, retain their black color.

Board properly made by the KB process is as moisture proof as that obtained by pasting with hot asphalt. There is the additional advantage of lower cost through dispensing with a secondary operation. Then, too, the reclamation of broke is in favor of the KB process.

The field for a KB board lies within the demand for a package that will stabilize moisture. It may offer moisture retention within the product, as required for washing powders; exclusion of moisture, as demanded by the cracker trade; or a combination of both, as for packaging tobacco, which is preconditioned to a desired moisture content.

The Universal Hydraulic Variable Speed Gear and Its Applications to Paper Mill Drives*

By D. R. Francis [1]

The Universal Hydraulic Variable Speed Gear, until recently known as the Waterbury Hydraulic Variable Speed Gear, is, as its name implies, a variable speed mechanism transmitting energy by hydraulic means.

The term "gear" has been slightly confusing at times, as to most people the word means a toothed wheel. It is used here to describe a composite mechanism performing specific functions in much the same sense that the word is applied to the steering gear on a ship, or the brake gear on a train, neither of which necessarily include toothed members.

Oil is the medium used for transmission energy.

Description of Transmission Mechanism

The transmission mechanism consists of two units; a pump commonly called the A-end, and a motor, or B-end. On a casual inspection the two units appear to be quite similar, excepting the pump is fitted with a control shaft whereby the operator is enabled to control the speed of a motor unit. On a more careful examination there are found to be other differences, such as the spacing of the cylinders, the shape of the valveplate pressure surfaces, etc. Each unit contains a revolving group consisting of main shaft, cylinder barrel, socket ring, pistons, connecting rods and other connected parts. (Fig. 1.)

FIG. 1
Revolving group consisting of main shaft cylinder barrel, socket ring, pistons, connecting rods and other connecting parts.

The Speed Gear is commonly built in two types, the Type C (Fig. 2)

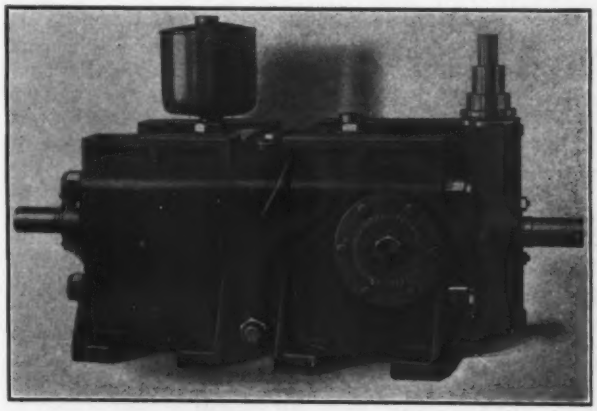


FIG. 2. Type C.
The Universal Hydraulic Variable Speed Gear.

where the two units are connected into a single block, and the type K (Fig. 3) where the two units are separate and distinct, and are connected together by piping, which makes possible almost any convenient arrangement.

To facilitate description, I have selected the type C: (Fig. 4)

The main shaft carries the socket ring on a universal joint which allows the socket ring to be tipped to any angle up to 20 degrees with its mid-position, which is at right angles to the shaft. The cylinder barrel is carried on trunnioned keys at the end of the shaft; these keys are slightly convex on the top and this combined with the trunnion on the key allows of a slight universal action between the cylinder barrel and the shaft. The cylinder barrel is fitted with a number of pistons which in turn are connected by ball-ended connecting rods to the socket ring. Rotation of the main shaft causes this entire group to turn around, but so long as the socket ring is normal to the shaft no axial movement of the pistons takes place.

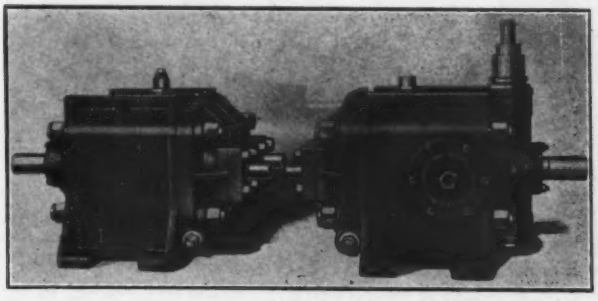


FIG. 3. Type K.

The socket ring rests on roller thrust bearings in a tilting box;

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

[1] Associate Member TAPPI. Chief Engineer, Waterbury Tool Co., Waterbury, Conn.

these thrust bearings take the thrust loads due to oil pressure developed by the pistons, The tilting box is supported on trunnions resting on bearings in the sides of the case: (Fig. 5)

The control shaft engines a pin on the back of the tilting box and movement of the control shaft therefore tips the tilting box and the socket ring. Any rotation of the main shaft, with the tilting box tipped produces an axial movement of the pistons approximately proportioned to the angle the socket ring has been tipped through; or in other words, to the control shaft movement. Axial movement of the pistons displaces oil with which the cylinders are filled; the displaced oil passes through a port opening in the end of the cylinder, thence through a port opening in the centre plate, commonly called the valveplate, and enters the corresponding cylinders in the B- or motor end. A port opening in the valveplate is long enough so that all pistons on one side of the vertical centre plane communicate with it. A piston in the extreme upper or lower position is at rest axially, and at the same time the port opening in its cylinder is closed by the land between the ports in the valveplate. The oil entering the cylinders of the motor end exerts a thrust on the pistons which is communicated back through the connecting rods to the socket ring.

The socket ring in the B-end rests on roller thrust bearings in an angle box which holds it at a fixed angle of 20 degrees.

The thrusts, P1, P2, P3, etc., Fig. 6 against this socket ring from the several connecting rods may each be resolved into two components, one of which N1, N2, N3, etc., is perpendicular to the thrust bearing, and the other, T1, T2, T3, etc., is tangential to it. The relation of the tangential components to the shaft will be seen by referring to Fig. 6.

It will be understood that each of these exerts a turning moment about the shaft and thereby produces rotation of the shaft.

Since the angle of the socket ring in the motor end is fixed, each piston has a fixed stroke and requires a fixed volume of oil to produce a full stroke. The stroke of the pistons in the pump end being variable, it will be seen that if they are on short stroke displacing only a small volume of oil each revolution, a correspondingly great number of revolutions must be made to produce one revolution of the motor end. Almost any desired ratio of speed between the input and output shafts may thus be produced. If the tilting box in the pump end is tipped in the

FIG. 4.
Internal Parts.

opposite direction, the direction of rotation of the motor is reversed.

With any cylinder the horsepower it can deliver depends on its piston area and length of stroke, pressure back of the piston and the number of strokes per unit of time and we have the familiar equation of horsepower equals $\frac{PLAN}{33,000}$. In the Universal Hydraulic Variable Speed Gear (A) is, of course, the combined area of all pistons. The terms $\frac{LA}{33,000}$, have been combined into a constant; for any given size of speed gear, this constant is size number divided by 100,000 so that horsepower is $\frac{PSN}{100,000}$. (P) equals pressure in pounds per square inch; (S) equals size number of the speed gear; (N) equals the r.p.m. of the motor end shaft. The allowable pressure is limited by the strength of the parts, particularly by the load the thrust bearings will carry. It

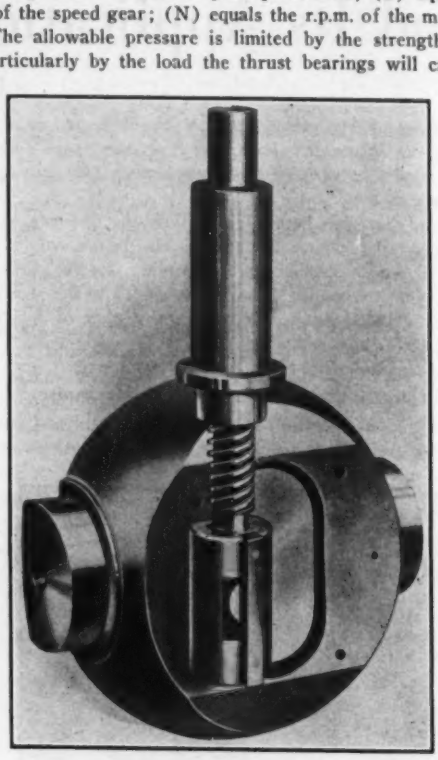


FIG. 5.
Tilting Box and Control Group.

will be seen that the horsepower is directly proportional to the speed and that for any speed gear to deliver its maximum horsepower it must be run at full speed.

Where the service is more or less intermittent with periods of rest between periods of work the speed gears are rated on oil pressures of 500 pounds per square inch, but where the service is continuous over a period of twenty-four hours, the maximum working pressure should not exceed 400 pounds per square inch.

The revolving groups are enclosed in cases having bearings for the main shaft, tilting box, control group, etc.; (Fig. 7).

These cases also serve as oil reservoirs catching any slight leakage there may be from the active system and furnishing a source of supply for replenishing purposes.

The centre plate of a type C machine, or the end plate of either the pump or motor unit is commonly called the valveplate, due to the fact that it contains certain valves: (Fig. 8).

There is one set of valves on each side, since the speed gear must function in either direction. A set of valves consists of a combination relief and replenishing valve; the relief valves function to relieve any unduly excessive pressure due to some part of the driven machine becoming jammed or some similar condition causing an excessive overload on the drive. These valves are usually set to relieve at pressures from two to two and a half times, the normal maximum. Combined with the relief valve is a ball check valve which functions as a replenishing valve when that side is under suction. This valve allows oil to flow to the active system from the inactive oil in the case, renewing oil that may have been lost from the active system due to leakage or to action of the relief valves.

I have several times spoken of leakage which may have had an alarming sound to some of you. The leakage I refer to is what

takes place between the active system and the inactive. You have probably noted from the pictures that there is no packing in the cylinders and no rings on the pistons. Each piston is a ground fit in its cylinder, a slight leakage will occur around each piston; around each end of each connecting rod, for there is a hole drilled through the end of the piston and longitudinally through the connecting rod to supply pressure oil for lubricating both balls of the connecting rods;

There is also a chance for leakage between the face of the valve-plate and the face of the cylinder barrel, in fact, this leakage is depended on for proper lubrication since these surfaces are bearings.

The combined leakage from all sources in both pump and motor units will average less than 0.5 per cent of the displacement of the pump.

History of Development

You are probably thinking the speed gear is some very recent development, if so, you will be interested to know that the Waterbury Hydraulic Variable Speed Gear, as it was called for many years, was originally designed by Messrs. Williams and Janney about the beginning of this century. It is known in Europe as the Williams-Janney Hydraulic Variable Speed Gear. Professor Williams was professor of machine design at Cornell University, and Mr. Janney was chief engineer of the Waterbury Tool Company.

The original design was prompted by the desire of the United States Navy Department at Washington to find some method of operating and controlling the big gun turrets on the battleships that would at the same time combine a more accurate and dependable control with a greater range of speeds and also eliminate the difficulties experienced in keeping the intricate and complicated Ward-Leonard electrical control in service.

The first successful working transmission, a size 7 was taken to Washington and demonstrated before officials of the Navy Department, and in June, 1906 was installed on the U. S. S. Virginia for turning a turret. The following year a larger one was built, a size 25, and this one was installed on the U. S. S. Illinois. The successful operation of these two led to the adoption of the speed gear as a standard equipment for all turret turning gears, and it was only a step from this to its adoption for gun elevating and for rammers. A short time later the pump ends were adopted for

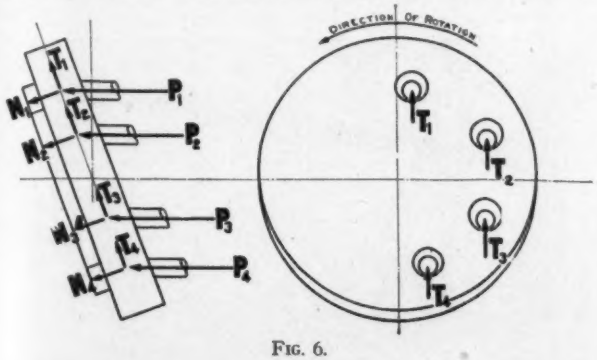


FIG. 6.

supplying the rams used for hoisting powder and shells to the guns.

In 1916 the contract was placed with the Waterbury Tool Company to design and build a hydraulic steering gear for the new U. S. S. New Mexico up to that time much the largest and fastest battleship built. Since that time our pump has been the standard for all submarine, battleship, scout cruiser and aeroplane carrier steering gears.

The speed gear is also used for operating capstans, boat hoists, winches, anchor windlasses, etc. More than two thousand speed gears of different sizes and types have been furnished the U. S. Government in the past twenty years for Army and Navy purposes. During these years of naval development, conditions did not permit entering the industrial fields. Occasionally a drive would be furnished for some special purposes, such for example as the 100 h.p. type C speed gear supplied the Kenosha, Wis., branch of the American Brass Company in January 1915 for operating one of their 60 ft rod mill drawbenches; it is still running apparently as well as when first installed. Also during 1919 a 60 h.p. type C speed gear was furnished the St. Louis branch of the United States Rubber Company for driving a rubber calender.

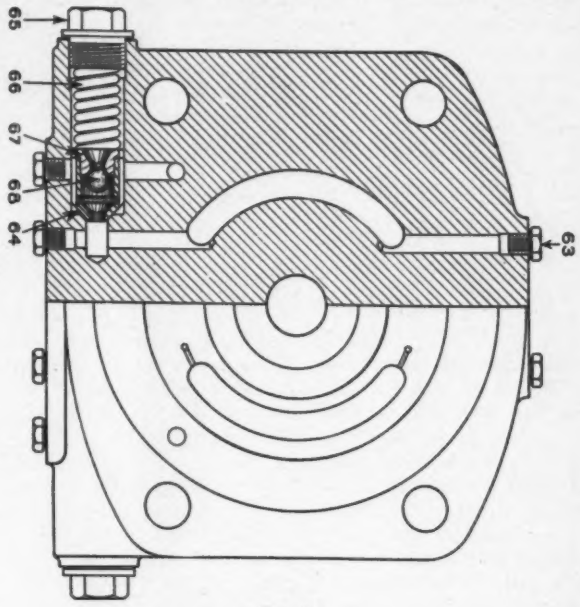


FIG. 8.
Section and Face of Valve Plate.

During the war about twenty-five pumps were furnished for steering gears on some of the Shipping Board vessels.

Application to Industrial Field

Beginning in 1922, the first real effort was made to interest possible users in the industrial field and more than two years elapsed before the first paper mill installation was made. Paper mill men

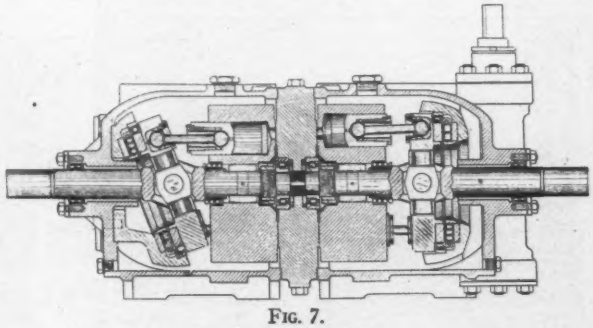


FIG. 7.
Sectional Assembly.

could not be convinced that anything like oil could transmit energy at a speed constant enough for their requirements, and each one held back waiting for the other fellow "to burn his fingers first."

In 1924 the Hollingsworth & Vose Company decided to put in a drive for their 84-inch four-cylinder paper machine in the mill at West Groton, Mass. This installation was made on a wooden scaffold midway between the constant and variable lines in such a way that if it did not function to their satisfaction, the belt between the constant and variable speed cones could be put back, restoring the original drive. After about eight weeks of service, July 28, 1924, the speed gear was moved to a permanent foundation, the speed cones were removed, and the only attention the speed gear has since received is an occasional replenishment of the oil.

Before the end of that year the Strathmore Paper Company installed a drive on a Hamblet cutter in their Woronoco, Mass., mill. The Worthy Paper Company, Mittineague, Mass. installed a drive for the variable line of their 66 inch fourdrinier paper machine, and the Brown Company, Berlin, N. H. installed a drive on a machine making paper tubes for underground conduits.

The following year started with an order from the Parsons Paper Company of Holyoke, Mass., for a drive for an 86-inch fourdrinier, and in less than two months was followed by an order from them for two more machine drives and a cutter drive. The three machine drives fully equipped this mill so far as papermachines go.

Paper Machine Sectional Drive

I might mention several interesting developments of that year, but probably the most novel was a series of experiments conducted by the Keith Paper Company of Turners Falls, Mass., looking toward the use of several speed gears as a section drive for a papermachine, replacing the customary backline and corner stands. After a number of conferences between the Keith Paper Company's engineer and the Waterbury Tool Company's engineer, it was decided that all difficulties in the way of making the installation in the very limited space available could be successfully met. I might mention that part of the problem was to install an 86-inch machine with drive in the rather cramped quarters previously taken by a 66 inch machine.

There remained the question of whether several units could be properly synchronized to run together. To determine the answer to this question, the Waterbury Tool Company loaned the necessary units to the Keith Company and their engineer, Mr. Dunbar installed the speed gear to drive the suction couch roll on one side of their existing machines. The A-end was driven from the variable speed line and the control only used for adjusting the draw. The test, extending over a period of several months, proved entirely satisfactory and it was decided to build a sectional drive consisting of six sections: fourdrinier end, two presses, drier section, size press, and cutter and layboy.

There are other novel features in connection with this machine. You will note the pyramid arrangement of driers; (Fig. 9).

This was done partly to shorten the drier section and partly to test some theories Mr. Dunbar had on drying. The driers are arranged in a pyramid, going up in steps at an angle of 45 degrees, the space below the driers being utilized for felt whippers, felt tighteners, and felt driers, all of which are above the floor level and exposed for inspection purposes. A very marked improvement in the sheet is reported, and this is credited to the drier arrangement. (Fig. 9).

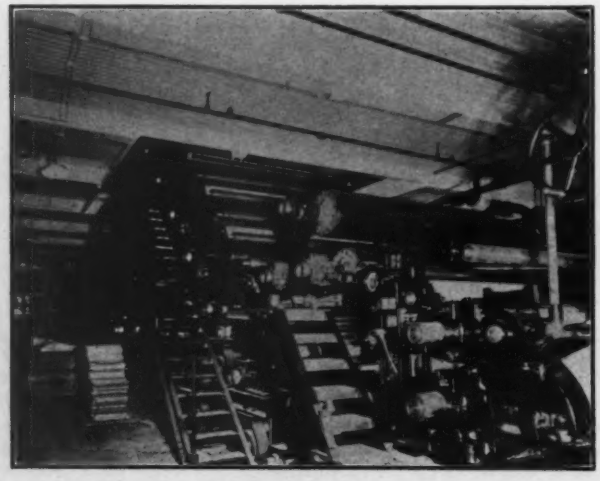


FIG. 9.
Pyramid Arrangement of Driers.
Keith Paper Company.

I previously mentioned that there were six drives. The power or pump units are located in the basement and all driven by a common motor; (Fig. 10).

You will note that the motor is in the centre of a long baseplate and that its shaft is extended in both directions and drives through gears to each pump shaft. The control shaft and the pipes to the B-ends are extended up through the ceiling. There are five drive units, Fig. 11, similar to the one shown, the cutter and layboy drive being different. These drive units consist of a hydraulic motor, a 16 to 1 Farrel-Sykes herringbone gear, and a hydraulically operated friction clutch, all of which is covered over so that the five units in operation appear as shown; Fig. 12.

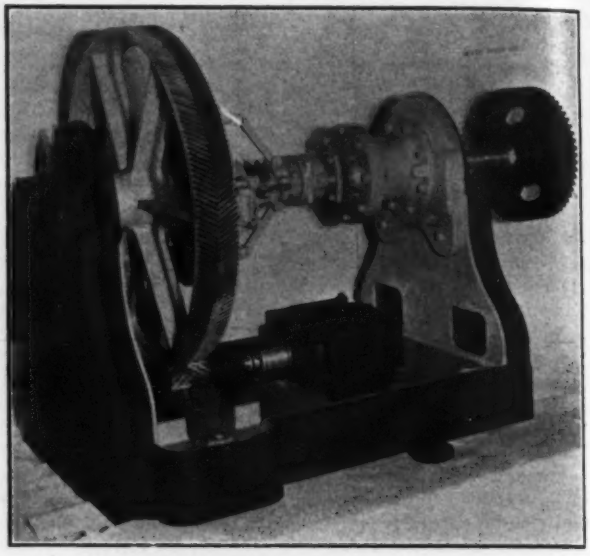


FIG. 11.
Farrel-Sykes Herringbone Gear, Driving Units of Paper Machine.

As previously mentioned the contral shafts of the pumps extend up through the machine room floor. Back of the driers is a shelf on which are mounted the electric control heads, Fig. 13, each consisting of a ¼ h.p., 1200 r.p.m. electric motor and a 10,000 to 1 gear reduction. If a motor should be out of commission for any cause there is a handwheel for emergency control. On the front of each

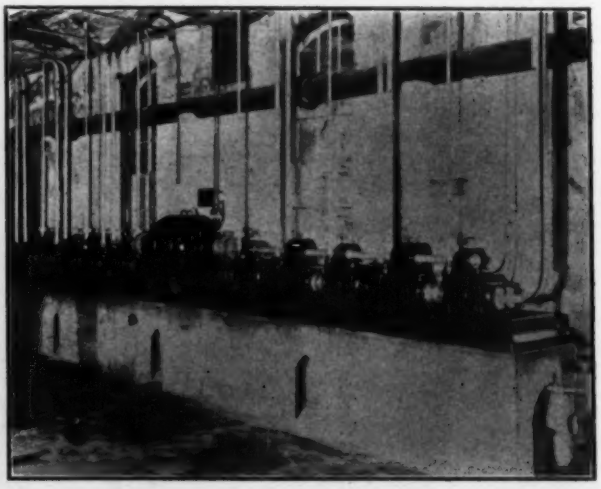


FIG. 10.
Sectional Drive on Paper Machine.
Keith Paper Company.

section is a pair of push buttons, Fig. 14 for controlling the speed of that section; one push button runs the motor forward and the other reverses it, the motor being idle except when a push button is being used. At the machine tender's table is the master station for controlling the speed of the entire machine; this operates all the control motors together. Difficulty might be experienced through failure of the motors to start, run, or stop together, but so far nothing of this sort has occurred. In the future such possibilities will be eliminated by using a single motor for the master control. This drive was started on January 7, 1926 and no change of any kind has been made in the drive except that the electric control of the cutter anl layboy was replaced by a hand control so that they could readily localize when cutting to the water mark.

Great credit is due Mr. Dunbar, chief engineer of the Keith Paper Company for going ahead with so novel an undertaking; for his knowledge of, and untiring study of the problems involved; and for the final success of the drive.

Some things have been learned since this drive was built and we know we could eliminate the friction clutch entirely by introducing a bypass valve between the two pipe lines. When opened the valve would allow the oil to circulate from the pressure to the suction lines without going through the motor end.

Many Other Installations

In 1926 a number of machine drives were installed and several new types of installations made, including drives for rewinders and shutters: (Figs. 15, 16).

A drive for a second press was installed at the A. P. W. mill in Albany in order to relieve the tension on a felt being run through two presses, both of which required driving; the extreme fineness of adjustment of speed makes possible the proper correction after each grinding of press rolls.

Experiments were also conducted at the Esleeck Manufacturing Company, Turners Falls, Mass. in driving a supercalender stack. These experiments confirmed our opinion that increased production could be obtained by being able to run each roll of paper at its proper speed, a poor roll requiring a slower speed than a good roll. At the same time each grade of paper can be run at its best speed regardless of the limitations of gear ratios. The posibility of elim-

FIG. 12.
Sectional Drive on Paper Machine.
Keith Paper Company.

inating clutch troubles by introducing a bypass valve was also successfully demonstrated.

The development in the paper mill field has been consistent and satisfactory; 1925 showed sales over four times that of 1924; 1926 showing a healthy increase over 1925, and the first three months of 1927 equalled the entire year of 1926.

I wish I might give you figures showing comparative efficiencies, power savings, etc.; unfortunately, no data exists of the power required by previous drives. In some cases there has undoubtedly been considerable saving in power as sometimes as much as a freight car load of shafting, pulleys, cones, etc. were removed.

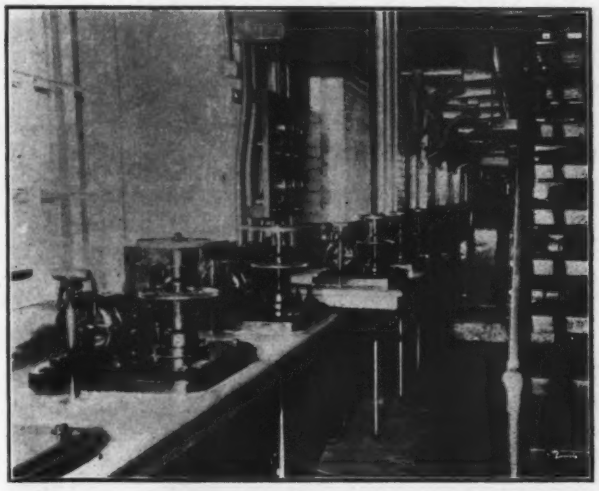


FIG. 13.
Electric Control Heads Behind Paper Machine.
Keith Paper Company.

In other cases nothing was removed from the existing drives so that the speed gear losses were added to all the previous losses and the power consumption would be higher than before. In practically all of the cases, any small increase or decrease of power would be of negligible importance, the big factors being facility in changing speeds, close adjustment of speed, and accurate maintenence of speed.

Efficiency of Speed Gear

The efficiency of the speed gear is as good or better than that

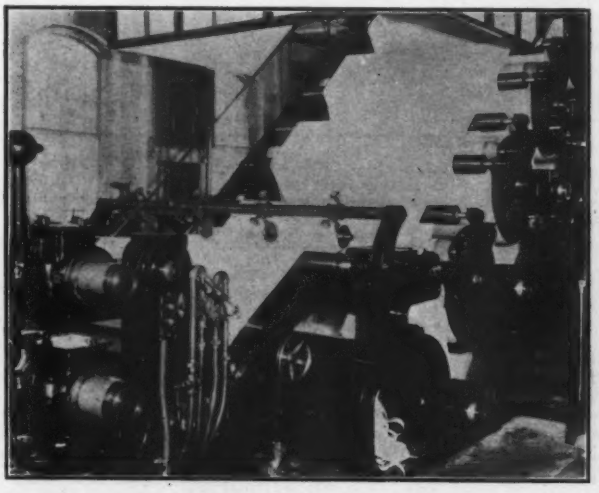


FIG. 14.
Push Button and Hand Control on Front of Paper Machine.
Keith Paper Company.

of any other variable speed having a reasonable range being between 80 and 85 per cent from about half speed to full speed.

We were recently told at one mill that the production of bristol board from their machine during the past ten years had been increased from 4,000 pounds in 8 hours, to 11,000 pounds in 8 hours,

and they credited about one-third of this increase to the hydraulic drive. Another mill recently reported an increase of 30% in tissue production since installing the speed gear due to being able to get exactly the proper maximum speed.

The A. P. W. Paper Company at Albany has made the statement their press drive saved its cost in the first three or four months in increased life of felts.

One mill superintendent stated the drive on the variable line of his paper machine paid for itself in the first six months in increased production due to eliminating shutdowns to change speeds.

Some installations have been justified by the elimination of hazards that previously existed; some by clearing up, for other purposes, large floor areas previously taken up by shafting, speed cones, belts, etc.

The problems of each mill are carefully studied before recommendations are made, and it is the policy of The Waterbury Tool Company not to furnish speed gears unless their engineering department has carefully investigated and approved the installation.

Summary

The purpose of this paper has been to bring before you a variable speed transmission undoubtedly a radical departure from anything many of you have previously been familiar with. Some of its characteristics are:

1—An extremely low creeping speed for purposes of inspection and for felt replacements.

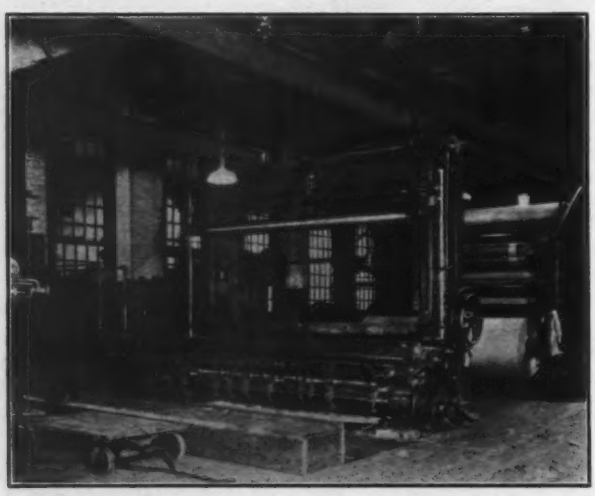


FIG. 15.
Driving Paper Machine Winder.
Robert Gair Company, Montville, Conn.

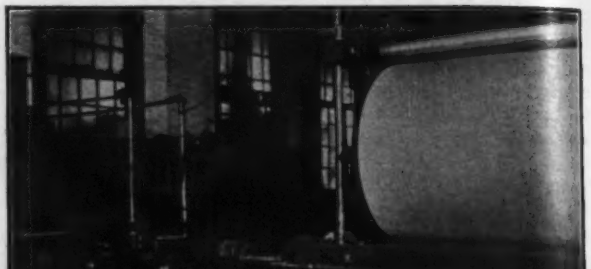


FIG. 16.
Close-Up View of Winder Drive.

2—Any speed from zero to the maximum without steps, enabling a paper machine to be operated at exactly the correct speed consistent with weight of paper.

3—A constant speed maintained at any setting.

4—Change of speed to suit changing conditions or change of weight without breaking the sheet.

5—Possibility of using one large motor for the entire paper machine driving the constant speed line at a constant speed and the variable line at any speed.

6—Electric motor or other source of power located at a considerable distance from the paper machine and only the necessary space for the B or Motor End need be provided at the machine.

7—A variable speed transmission unaffected by moisture changing room temperature, or dirt. Using a type K the electric motor may be located in a clean, dry place.

8—Oil being the transmission medium, and all working parts submerged in it, a minimum of attention is required, and wear is reduced to an almost negligible amount.

9—Control of speed is easy and positive, and may be remote and from as many stations as desired.

10—Due to compactness of units an installation may be made in place of any existing drive, and frequently can be made while the existing drive is running, entailing a minimum of lost time in changing over.

11—Where used in a sectional drive clutches can be entirely eliminated.

A. P. & P. A. Issues Weekly Business Review

Beginning with this week's issue the Weekly Business Review published by the Association is printed in a manner more suitable for use and easier to read.

This weekly bulletin has gradually developed to the point where it is receiving considerable attention by the industry because of its definite statements concerning other industries which tend to influence the consumption of paper and because of its clear analyses of various other general situations which are of interest and importance to the paper industry.

The Association plans to give in this bulletin matters of interest concerning the Association's activities and statistics of paper and pulp as well as brief reports on raw materials.

When the Weekly Business Review has attained the above features, it would seem that the bulletin will be one of the most useful of its kind to the paper industry.

New Caldwell Speed Reducer

The H. W. Caldwell & Son Company, Chicago, a subsidiary of the Link-Belt Company, have just issued an attractive booklet describing and illustrating the new Caldwell Speed Reducer, which contains many desirable features.

The Caldwell Speed Reducer is a self-contained unit which combines two separate drives: a Link-Belt Silent Chain Drive from the high speed shaft; and a cut spur gear drive to the low speed shaft; made in sizes to furnish ratios from 7:1 to 40:1 in Type "A," or to 30:1 in Type "B." Type "A" is designed for general industrial uses, while type "B" is for Screw Conveyor service.

With the Caldwell Speed Reducer it is not necessary to use a flexible coupling on the motor shaft; the Silent Chain Drive provides the necessary flexibility between the motor and the speed reducer shaft.

Sulphite Waste Liquor Utilization Problems*

By W. E. Byron Baker[1]

The problem of the utilization of sulphite cellulose waste liquor is as old as the industry itself, and interest in the solution of the problem dates back to the foundation of the industry. Such pioneers as Mitscherlich and Tilghman early realized the importance of duly considering the disposal of the dissolved wood substance in the spent liquors, and within a few years after the first commercial operations of the sulphite pulp process obtained patent rights covering the first methods devised by them for utilization of the waste liquors, or spent liquors from the cooking operation.

In the cooking of a ton of sulphite pulp there is produced a volume of liquor containing in dissolved form a quantity of substance which in dry form weighs approximately 1.25 tons. This solution, as it comes from the digesters, has a concentration of 8 to 10 per cent dissolved dry matter, depending upon varying conditions, according to American practice. The average concentration is probably about nine per cent so that each ton of pulp gives about 11 to 14 tons liquor discharge available. When we consider the thousands of tons of pulp produced in the United States daily, we gain some conception of the magnitude of the potentialities of sulphite waste liquor utilization.

When the economic loss entailed by the waste of this vast amount of wood substance is adequately realized, more will be accomplished as the result of the greater organized effort which will surely be expended as a consequence of the realization, and we may then look for more tangible and broadly developed commercial methods of utilization.

The Stream Pollution Problem

Recently considerable attention has been focused on these problems by reason of agitation on the part of sportsmen, fishermen and all interested in pure streams. Many complaints are made concerning the discharge of sulphite cellulose waste liquor into streams, and in by far the majority of cases these are based on rather insecure grounds, and sight is lost of the fact that any sulphite pulp manufacturer would be eager to adopt any practical and economically feasible method offered or applicable to his plant condition for utilizing these liquors, thus eliminating their discharge into the streams.

Who can tell what valuable products may some day in the not distant future be derived from these waste liquors? Less than a century ago, who could conceive of the almost countless coal tar dyes of every hue of the rainbow as derivable from the despised coal tar, to say nothing of the very numerous pharmaceutical products, explosives, and photographic chemicals which have come from the same source. Is it not easy to believe that wood substance + chemical knowledge can yield just as valuable products to civilization as coal + chemical knowledge, particularly if we do not forget the relationship between coal and wood. We lack sufficient chemical knowledge of wood. This is why we need $30 worth of wood and about $5 worth of chemicals to make a ton of unbleached sulphite pulp which is worth about $60, while we waste more than a ton of the less resistant portions of the wood. To continue the analogy, it is interesting to note that in coal, the less resistant portions have yielded the most valuable products, the coke corresponding to our pulp. For instance, by the Bergius process, one takes a ton of soft coal, worth a few dollars, and a few dollars worth of hydrogen and chemicals, and makes about a hundred dollars worth of high grade lubricants, etc., and a few dollars worth of coke.

Contents of Waste Liquor

The ton and a quarter of dissolved matter referred to as produced in making one ton of pulp may be said to consist of approximately the following amounts of principal substances, viz.:

Lignin	1,200 lb.
Carbohydrates	600 lb.
Sulphur dioxide	450 lb.
Combined with lignin, lime and mineral matter	250 lb.

besides, small quantities of resin and fats, and also proteins are listed by some investigators.

The first two items listed are derived directly from the wood, and it is about the first, lignin, that we possess at least definite chemical knowledge, because even in the hands of the most skilled chemists it can not be or rather has not been made to perform or react in what might be termed orthodox chemical manner. Those who are interested in studying the reacaions, and somewhat incomplete conclusions as to the chemical constitution of lignin will do well by consulting the literature, a fair portion of which will be found in recent and current series of Technical Association Papers. These things are mentioned because future real progress in sulphite waste liquor utilization must be founded upon more exact knowledge of the chemical constitution and deportment of lignin.

For general knowledge of the subject of the utilization of these liquors, one might consult profitably the Bulletin No. 66 of the Department of the Interior of Canada, containing a review of the literature by Johnsen and Hovey. It is regretable that there is nothing in this same form more recent, this being now seven years old. Examination of this publication gives a good idea of the general trend of the developments, and it is systematically arranged. Investigation of the patents issued in the meantime will bring the subject and its recent developments reasonably up to date.

Methods More or Less in Use

Of the numerous methods of utilization of sulphite waste liquor which have been suggested, comparatively few have attained any commercial significance. These have to do with the making of

(a) Binders, adhesive, and gums,
(b) Tanning extracts and adjuncts,
(c) Alcohol,
(d) Fuel in crude liquid form,
(e) Roads.

In the making of binders in nearly all cases the waste liquor is subjected to only relatively minor chemical changes before and incident to concentration into the thick syrupy liquor in which it usually is employed. These binders may therefore be considered as consisting essentially as crude waste liquor in concentrated form. The minor treatments applied are for the purpose of facilitating their concentration without the very much greater troubles which would otherwise be encountered in given types of concentration apparatus from the deposit of scale on the heating surfaces, and from corrosion. The same is essentially true of the manufacture of adhesives and gums, although in these cases the nature of the organic matter or wood substance itself is changed to certain extents, by the chemical treatments. These changes generally have for their purpose improvement in adhesive properties. In some cases adhesive blends are made, but the principal drawback is in the dark color of the concentrated waste liquor. Numerous attempts have been made to discharge this color but in no case has this been done without destroying the adhesive properties present. The dark color limits the use and application of these materials very considerably, precluding their employment in pasting paper together where the color would

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

[1] Member of TAPPI. Chief Chemist, Continental Paper & Bag Mills, New York, N. Y.

"shine" through or be visible by reason of the penetration of the adhesive and the transparency or translucency of the paper. The writer believes, however, that the time is not far distant when kraft paper bags, particularly in the heavier weights and darker colors, will be manufactured using adhesives made from these products in part or in whole, instead of the starch pastes now employed. Some experiments have also been made to demonstrate the possibilities in the application of these adhesives in the binding of books. Favorable results are indicated. The writer has disposed of considerable tonnage of these adhesives by use of them in the manufacture of cores for rolls of paper. Similar use can be made of these products in the manufacture of strawboard cores of other types, and perhaps in making mailing tubes.

Binders

An increasing tonnage of binders from this source is used in the foundry industry, in the preparation of foundry cores. This use may be considered well established.

The largest field for the application of binders made from sulphite cellulose waste liquors is in the manufacture of coal briquets. Increasing amounts of these products are so used because the briquets so made possess some points of superiority over those made with the binders otherwise used, which are derived from asphaltum bases. Another parallel application is in the manufacture of ore briquets, which is practiced in some branches of metallurgy.

Reference might well be made at this point to a misconception existing in the minds of many who seem to think that the success of these binders and adhesives is questionable until some way is found to render them insoluble in water. The same thought is also voiced frequently in reference to the use of these products in making roads, and perhaps in this connection with greater validity. An improvement would be effected by the conversion into an insoluble form after application. This can be and has been done in a measure. The fact must not be overlooked, however, that every attempt to convert these materials into forms insoluble in water must partake of the nature of a reversal of the type of reactions by which the materials are originally changed from the insoluble to the soluble form. Under these conditions the adhesive properties created are destroyed by the reversal. It is likewise true that while these reversal products are insoluble in water, they have a great attraction for it, and swell considerably.

Tanning Extracts

Sulphite cellulose waste liquor products have found a certain amount of application in the leather industry as tanning extracts and "fillers," principally as the latter. These products contain little or no true tannin, but contain fifty or slightly more per cent "material absorbed by hide powder" as the leather chemists express it, since this points out its similarity to tannin in the commercially most important characteristic. A great drawback to the use of these sulphite cellulose extracts is in the fact that they do not mix equally well with all other tanning extracts. In some cases some of the true tannin substance is precipitated. In others the content of "material absorbed by hide powder" present in the combined extract is increased above the quantity expected or indicated by the summation of the quantities present originally individually. Whether this is decreased or increased is dependent upon the properties of the other components of the "blend." These are questions demanding exact knowledge, skill, and careful consideration.

Practically all leather manufacturers using sulphite cellulose extract insist on the necessity of reducing the lime content to an absolute minimum. In many cases "tinny" tannages result from the use of improperly prepared sulphite cellulose extracts, and this difficulty is almost always claimed to be due to the presence of some lime. If the writer's somewhat limited experience and observation is of any value whatsoever in this connection, it would appear that the presence of residual sulphites is also an important factor in this.

The majority of these products used in the leather industry are used as "fillers" in the heavy leather manufacture, in many cases being added by a "drumming" process.

It must be mentioned that in all cases where these extracts are used, the percentage of iron present must not exceed "traces," or very, very small percentages, because of its darkening or blackening action.

Sulphite Alcohol

The production of alcohol (ethyl or grain) from sulphite cellulose waste liquor is an industry which has undergone more thorough and refined commercial development than any other of these by-product industries, excepting possibly one, which is also closely related to alcohol production, viz., the manufacture of yeast. During the World War and shortly after, the production of alcohol developed to such an extent in Scandinavia and Europe that there were twenty-two plants operating in connection with Aktiebolaget Ethyl, of Stockholm. It is true that most of these plants made alcohol for conversion into motor fuel for automobiles, and that when the economic balance was again established, and the prices of gasoline returned to normal, the spirit fuel could not longer compete. The result was that only those making rectified spirits for alcohol beverages and pharmaceutical and medicinal use could afford to continue operations.

At least one company manufacturing sulphite pulp in the United States has been manufacturing alcohol consistently over a period of time. There is some possibility of some others entering the field operating under some newly improved processes in the not very distant future.

It must be stated in this connection that alcohol manufacture alone does not constitute an ideal solution of the byproduct problem, because only the fermentable sugar portion (carbohydrates) of the liquor enters into the reaction. Thus the major portion of the liquor remains to be dealt with. Under proper economic conditions it is possible to convert these residual matters into liquid fuel or into binders or tanning extracts. By combination of these two or more types of processes advantageous economies are realized in each case which would be lost if the processes were operated individually because each process possesses heat and chemical requirements in common. These costs are, of course, shared when more than one such process is operated simultaneously.

Yeast Production

Closely related to the production of alcohol is the production of yeast. In alcohol manufacture we control the yeast so as to cause the yeast cells to utilize the energy derived from the food supplied principally in the fermentation of the fermentable carbohydrates (sugars) present into alcohol. In the production of yeast, conditions are differently controlled, so that the energy is expended in propagation or reproduction of the cells, while alcohol production is decreased considerably, and treated as a secondary issue. A few of the Scandinavian mills which were obliged to discontinue alcohol manufacture have now taken up yeast manufacture. When all the technical problems of yeast manufacture are solved in the most efficient manner this method of sulphite cellulose liquor utilization appears to promise more lucrative returns than any other thus far evolved.

Before leaving the subject of alcohol and yeast, it must be pointed out that while alcohol can be manufactured from these liquors at costs considerably below the selling price of denatured alcohol, the manufacture of alcohol from the usual sources has some distinct technical and economic advantages over the proposed manufacture from sulphite waste liquor, principally in the fact that the basic raw products entering into the process are so very much richer in fermentable sugars than is sulphite waste liquor, comparing ratios on dry basis in each case. The same applies

with practically equal force to yeast manufacture. Under all such conditions smaller volumes per unit of product have to be handled, stored, heated and processed. This means less capital and operating costs, and the only compensating factor is the lower cost of the sulphite waste liquor, which can be considered as simply equal to the cost of separating it from the pulp, and pumping it to the byproduct alcohol plant.

From the consideration of these points it seems evident that the business success of alcohol and yeast manufacture from sulphite waste liquor is largely dependent upon the sale of these products through established channels, if the industry is to develop successfully on a very large scale. If the sulphite liquor alcohol industry develops to such a magnitude as warrants it, it seems obvious that cooperative marketing arrangements could be effected, saving pulp manufacturers the trouble of entering a different field of sales endeavor, new to them, but already established by others, for the purpose of the disposal of so small a volume of alcohol as most pulp mills are capable of producing individually. Another option would of course be the formation of a sales association or company representing many mills. Such an organization would correspond to Aktiebaloget Ethyl in Scandinavia.

The yield of alcohol from the liquors from one ton of pulp amounts to 15 to 20 gallons of 95 per cent strength.

Possibilities of Fuel

The possibilities in the production of fuel from sulphite cellulose waste liquor have received considerable attention. The technical difficulties involved are in most cases not nearly so great as ordinarily supposed. As a matter of fact, the problem may be considered as one in economics rather than a technical one, depending upon the relationship between the cost of power and the cost of coal at the point of operation, and also upon local conditions in reference to boiler house efficiency.

Several different types of procedures have been suggested insofar as heat technic is concerned. Some plans provide for the concentration of the waste liquor in multiple effect evaporators, employing more than four bodies in order to gain economy in evaporation of the large quantities of water present which must be removed to produce a fuel capable of producing a sufficiently large excess of heat over that required to evaporate the residual water present in the concentrated fuel, which should contain not more than 50 per cent water as a maximum, and preferably not more than 30 per cent. In this connection it must be remembered that the fuel value of the dissolved matter in dry form is approximately 8,000 B. t. u. per pound. From this must be deducted the heat expended in evaporating any water associated with the dry matter in the form of its concentrated solution, as it is fed to the furnace.

Thermo Compression

Other plans for concentrating the waste liquors provide for the use of flue gases from the boiler house as the source of evaporation heat, and also for evaporation with vapor re-compression, the latter sometimes referred to as "thermo-compression systems." The former of these plans is particularly applicable where the boiler house is not equipped with economizers. In such cases the heat wasted ordinarily in the flue gases is utilized in the heating and evaporation of the sulphite waste liquors, and in addition, if the evaporation is by direct contact further advantages can be realized because under such conditions the liquors "scrub" the flue gases, removing to a large extent the unconsumed coal or carbon in the smoke. It is also possible to partly combine this process with multiple effect operation, reutilizing the vapors given off in the first stages of the evaporation.

The use of thermo-compression systems in Europe has attracted considerable attention, as the evaporation economies attainable are claimed to be considerably in excess of those of other systems. By the use of these systems the vapors from a single effect are compressed to just such an extent as provides temperature elevation sufficient for reuse in the same effect at the required temperature difference. The compression is accomplished with electrically driven compressor usually. The cost of current is charged against the process, and where very cheap current is available from abundant water power, and the price of coal is relatively high, this process is said to be economically quite feasible, because with single effect operation, so far as steam consumed is concerned, it is possible to operate with the same economies as would be possible in a twelve to fifteen body multiple effect.

It would scarcely be in order to leave the discussion of thermo-compression systems without reference to the use of steam jet thermo-compressors. While these do not afford the evaporation economy of the rotary compressors, there are no moving parts present. By jet action a considerable percentage of the vapors are recirculated along with the high pressure live steam admitted. As this percentage may amount to sixty by good design, it is evident that by this operation we get the equivalent of about "two and one-half effect."

Burning the Concentrated Liquor

After we have our fuel in the form of a concentrated liquid of not less than 50 per cent dry matter content, the matter of burning it presents no serious technical difficulties. Naturally it is advantageous to have it available in a form containing more than 50 per cent dissolved dry matter. There are several general methods for burning this material. One of the first methods tried consisted of spraying the concentrated extract into the fire or upon the layer of coal on a traveling grate stoker. There are no difficulties in carrying out this scheme. It has been done in several cases in Europe, with good efficiency. Other methods provide for the burning of the concentrated liquor alone. In these cases spray type furnaces are used. Details in design of several types of these are being rapidly perfected. In general, I may say that the details of oil burning practice are in a large measure guiding the developments along this line. Recently the writer's attention was attracted by a new type combination powdered coal and oil burner. From all appearances the burning of sulphite liquor fuel through this burner will be a simple matter.

For Roads and Road Treatment

Another extensive use for concentrated sulphite cellulose waste liquor is in road building and road treatment. In the term "road treatment" is understood the spraying of roads with these concentrates periodically. The action of the material when so used classifies it as a temporary or semi-permanent dust preventive and road-binder. In building roads with concentrated sulphite waste liquor, it is mixed with certain compositions of argillaceous and siliceous rocks. Those silicate rocks which are subject to most attack by acid are most suitable, for some of these silicates undergo slow decomposition in the presence of the liquor, and the silicic acid thus formed makes a natural bond, which presently becomes insoluble. Mineral mixtures containing blast furnace slag are useful in road making in connection with concentrated sulphite liquor.

Higher Concentration Necessary

It is clearly evident from the foregoing discussion that practically all of the schemes for utilization require the product in more concentrated form than that in which it is discharged from the digesters. The general steps in realizing this end arrange themselves about as follows:

(a) The separation of the largest quantity of liquor possible from the pulp, and in most concentrated form, i.e., with the least dilution due to washing the pulp.

(b) The practice of such chemical treatment as is necessary, having in view the product being made, and the most satisfactory operation of the evaporation apparatus.

(c) The concentration of the treated liquor in multiple effect evaporators, or the equivalent.

(d) The conduct of chemical treatment operations on the concentrate, these depending upon particular products being prepared.

(e) The conversion of the treated concentrate into dry form, if character of product, purpose and uses dictate this.

The relative success with which these various steps are carried out is entirely dependent upon the amount of sound engineering knowledge applied. The proper solution of the first step, for instance, indicates clearly the following of established good practice in the sulphate and soda pulp process. The treatments under the second (b) step are dependent upon the type of apparatus used for the concentration, and the metal of which it is constructed. The exact method of operation under the third step (c) governs to a large extent the economy experienced, and also the relative amount of corrosion and scaling encountered. There is room for the application of good chemical engineering practice in this connection as the ultimate success of the operation in a large measure is dependent upon the proper conduct of the evaporation. It is quite impossible to lay down any broad general rules, for the conditions in each case vary very widely. Scaling trouble on the heating surfaces has always been considered the principal problem to be solved. While this has been responsible for nearly all of the failures, it is nevertheless certain that more than 95 per cent of the scale formation is preventable by discovering and maintaining the proper balance of conditions applying to each operation.

Some people have the erroneous opinion that the success of an operation is entirely dependent upon the type of apparatus used, or upon one particular step in chemical or mechanical treatment. For example, the writer recently was talking with a man engaged in the concentration of sulphite waste liquor, who volunteered the statement that it was absolutely impossible to do the concentration in a certain type of evaporator. As a matter of fact, the very type mentioned is one which has been in use very successfully at one plant for five years. In fact, so far as the success of the operation is concerned, as nearly as can be learned, there is less scale trouble encountered than in most of the other operations, but this is not nearly so greatly dependent upon the type of apparatus as the application of the correct knowledge and principles in the operation of the apparatus.

The conduct of the fourth (d) step is almost entirely dependent upon the products to be made, and the exact nature of our contemplated product at this point. For instance, the making of an extract for use in the leather industry demands special treatments at this point designed for the removal of such ingredients as may be injurious, for example—lime and iron. This type of treatment must naturally be conducted in special apparatus out of further contact with iron. In most cases filtration steps are necessary here, and such apparatus must be used in this case as meet these special demands in the best manner.

The conduct of the fifth (e) step is also subject to variation principally depending in this case on economies and types of product desired. Spray driers of various types have been suggested and tried. Some of these methods doubtlessly can be perfected to such a point as make them commercially feasible. The writer's experience with these methods does not warrant the use of them where it is possible to use, with equally good results, a vacuum drum drier. The spray drier processes have not been found either as economical or as safe as the vacuum drum processes.

An Economic Problem

Summarizing all that has been said previously, it may be concluded that the technical aspects of the problems cannot be said to be nearly as difficult as is generally believed. The real problems in sulphite waste liquor utilization are of an economic nature. Most of the products thus far made are rather crude and thus come into competition with other relatively low priced materials. Only a relatively few applications have been developed to any appreciable extent, and it is unfortunate that the several manufacturers who have undertaken the utilization of sulphite liquor have directed their activities along these thus far limited lines. The amount of sulphite liquor produced, for example, by a moderate sized sulphite mill is sufficient to supply the entire demand in the country for foundry core binders. The production of another fair sized plant supplies all which has thus far been in demand for the making of roads, and this application has the disadvantage of being seasonal. The production of another plant takes care of the demand for briquets in metallurgical work. A certain increasing quantity finds application in fuel briquets, but again the production of the plant can provide for this. It is thus easily seen that the entry of another producer into the field making these types of products would quite likely result in over-production to such an extent that the market prices which the products could demand would drop to a still much lower lever than at present. The result would be that all of the producers of such products would be losing money.

The Most Reasonable Solution

The most reasonable solution of these problems appears to be the manufacture of grain alcohol and subsequent concentration of the unused portion of the liquor for use as fuel. There are several cases in the industry where this is economically possible, and some of the mills are giving careful attention to these possibilities.

The big future possibility in sulphite waste liquor utilization appears to be dependent upon the ability to make from these liquors some product which enters into our everyday life as an article of consumption. For instance, if the methods are perfected for using these materials in some phase or stage of house construction this will create a considerable demand. Experiments are now under way along these lines in Scandinavia, and there is at least one small settlement in which the houses are built of composition into which concentrated cellulose sulphite extract enters in considerable proportion. As another example, one might cite the desirability of finding a successful application of these materials in agriculture. The making of fertilizers from these materials has received the attention of investigators for some time. Even Tilghman in the first days of the sulphite pulp industry had a scheme for the utilization of waste sulphite liquor for fertilizing purposes. Of course, it was not successful and was not developed, but this does not preclude such a possibility at the hands of modern chemistry and research.

Another use, which might be developed, involves the making of fodders and cattle foods, in which sulphite liquor plays a part. In Europe a considerable amount of work was done on this subject by Stutzer.

These are only a few of the lines along which we can look for developments which might enable us to consume the vast quantity of sulphite liquor available. Of course, when the material is used with more perfect success and is more generally applicable to the making of so-called permanent roads, we will have another use.

My point is that if we manufacture 4,000 to 5,000 tons of sulphite pulp a day, we will have available at least an equal amount of dry matter dissolved in the form of sulphite liquor, to utilize. On a per capita basis in the United States, this amounts to a tenth of a pound per capita per day. This, we must grant, is no small quantity when we consider that the paper consumption per capita per day is less than half a pound, and when we remember that only thirty to forty years back the paper consumption was not more than a tenth of a pound per capita per day.

Conclusion

The real solution of the sulphite liquor problem depends on the chemical conversion of it into some types of products extensively needed to accelerate the already highly accelerated progress of civilization. Sulphite liquor originated in the soil, and it seems most logical to replace it as directly as possible, hence the suggested use in agriculture.

After all, there is no problem so important to the human race as the matter of increasing the productivity of the fields. The population is increasing faster than the production of the fields, and it is obvious that there is, of course, some limit. If sulphite waste liquor can extend this limit, its place in the world's affairs is established.

Powdered Fuel Combustion and Furnace Design*

By T. A. McGee, Furnace Engineering Co., Inc., 5 Beekman St., New York City

The comparatively recent widespread use of powdered fuel, accompanied by a sustained trend to continuous high ratings, is causing deep study and consideration as to what type of furnace is best suited most efficiently and economically to meet the demands of operation. Flexibility, complete and efficient combustion, smaller volumes with reduced cost, decreased outage and reliability are some of the requirements which must be met.

An intelligent study of the load demand, best expressed in thousands of pounds of steam or millions of B. t. u. per hour, should be made and the load distributed over two, three or whatever number boilers conveniently answer the total demand. Consideration should be given to severity and length of peaks as well as length and degree of minimum demand. The regularity, or irregularity, of demand curve determines whether design should accommodate itself to the total proportionate range for each boiler or whether the length of minimum demand is such as to permit the banking of a number of boilers, permitting the remainder to steam at a rating closely approximating the average condition. The latter condition is, of course, preferable.

Selection of Coal

The coals that are continuously available for use in a given location should be thoroughly and intelligently studied. Accurate figures indicating the percentages of moisture (both inherent and surface), volatile matter, fixed carbon, ash and sulphur, the heating value per pound of the coal and the fusion temperature of the ash should be secured.

High surface moisture reduces both the capacity and the fineness of grind of most powdered fuel preparation equipment. In the case of all storage systems and most unit systems either predrying or admission of hot air or flue gas to the mills is resorted to in order to avoid the effect of wet coal. Inherent moisture does not usually contribute to objectionable effects.

Volatile matter, from analysis, is very deceptive as an indication of the susceptibility of coal to fine pulverization. Generally speaking, a low volatile (15 to 25 per cent) coal will be found to be quite friable and high volatile (30 to 40 per cent) coal to be more resistant to pulverization. If data on fineness is not obtainable, a fairly accurate and simple determination may be made by crushing a small sample with a flat blade on a square of glass. A minute's work will give a very good idea of the resultant product from a pulverizer. High volatile coal is usually laminated and this mitigates against fineness of grind. If the high volatile coal shows an economic advantage it is well to use it, understanding that a grind comparable to a low volatile coal can be obtained at a slightly higher charge for maintenance and power.

Percentage of Fixed Carbon

The percentage of fixed carbon may be said generally to be inversely proportional to the volatile content.

Ash percentage is an indication of the amount of refuse which must be handled either in the pit, ash precipitator or stack. High sulphur lowers the fusion temperature of the ash and if low exit temperatures are desired care must be taken to avoid acid action on breeching and stack. Iron pyrites increases maintenance of equipment and furnaces. The presence of slate is objectionable because it increases maintenance and power charges.

Careful consideration of the data obtained will assist in choosing the most economical coal on a B. t. u. delivered to the furnace per dollar basis.

Burning of the Coal

It is difficult theoretically to forecast or to determine practically just what the action of coal is in a furnace. It is quite probable that numerous complex intermediate products are formed in the process of combustion. It is important that some segregation of the combustibles be established so that the more important reactions can be traced through.

Hydrocarbons

They are present in the form of methane (CH_4), ethane (C_2H_6), ethylene (C_2H_4), and acetylene (C_2H_2). All four of these hydrocarbons combine with oxygen in segregated but rapid steps until they arive at a common product, formaldehyde (H_2CO). In this process, steam and carbon monoxide are formed as secondary products. The formaldehyde hydralyzes to formic acid and then to carbonic acid gas which, in turn, decomposes to carbon dioxide (CO_2) and steam. Or it may, by thermal decomposition, break down to carbon monoxide and free hydrogen.

Carbon

Carbon, present in its pure form (fixed carbon), would seem to be susceptible only to a limited number of reactions but much disagreement exists as to the steps it undergoes before it leaves the furnace as carbon dioxide. One thing is certain; dry carbon monoxide and dry oxygen do not unite. A trace of water (steam) must be present to determine the combustion of the monoxide. Gases, such as hydrogen, hydrogen sulphide, ammonia or ethylene have been observed to act similarly to steam, but, of these, ethylene is the only one usually present in a furnace. Any substance that will form steam can determine (or complete) the combustion. Besides ethylene, the other hydrocarbons, in the process of combustion, throw off steam and this tends rapidly to complete the burning of the carbon monoxide. It also appears that carbon, under favorable conditions, may react with carbon dioxide to form carbon monoxide. The equations, which cover the formation of carbon monoxide from carbon, seem to be as follows:

$$2C + O_2 = 2CO$$
$$C + H_2O = CO + H_2$$
$$C + CO_2 = 2CO$$

Hydrogen and Steam

Free hydrogen, in the presence of oxygen, burns to water (steam) as follows:

$$2H_2 + O_2 = 2H_2O$$

Water vapor (steam) cannot, of itself, determine the combustion of carbon monoxide because the reaction

$$CO + H_2O \rightleftarrows CO_2 + H_2$$

is reversible and favors the monoxide and vapor form.

Carbon Dioxide

Carbon monoxide seems incapable of combining directly with molecular oxygen. Atomic (nascent) oxygen must be made available either by hydrogen peroxide (H_2O_2) or by highly superheated (activated) water vapor in order to determine the combustion of the monoxide.

$$CO + H_2O + O_2 = CO_2 + H_2O_2$$
$$CO + H_2O_2 = CO_2 + H_2O$$
$$CO + :O = CO_2$$

In addition to its importance in the burning of CO, nascent oxygen seems to play an essential part in the rapid determination of the combustion of the hydrocarbons. Observation of various furnaces, fired by different grades of coals, and careful analysis of numerous tests lead to the conclusion that the heat loss, due to the escape of unburned hydrocarbons, more so than the loss due to the presence of carbon monoxide in the flue gas, is the reason why higher efficiencies are not maintained. Invariably, an attendant circumstances to hydro carbon loss is a comparatively low moisture coal. There seems to be a very definite relation between the percentage of volatile matter in the coal and the weight of water vapor necessary to insure complete combustion. From the partial or total combustion of the hydrocarbons there results a volume of steam sufficient to determine the combustion of the carbon

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

monoxide. A definite amount of moisture, introduced with the coal into the furnace, speeds up the reaction of the hydrocarbons and effects more rapid and complete burning of the combustibles.

The writer has found that if the percentage of volatile matter is multiplied by an empirical factor ¼, the result indicates the approximate percentage by weight of moisture necessary.

Combustion Rates and Furnace Volumes

The long U-shaped flame travel necessitated the use of large furnaces. A small percentage of the air required for combustion was used to vehicle the coal vertically downward at high velocities into the furnace. The remainder of the required air was either induced or forced into the furnace through hollow walls. The coal was called upon to search for its oxygen and this resulted in long flame length (40 to 60 feet) and large furnaces.

Present practice recommends that introduction of all the necessary air with properly conditioned coal through horizontal turbulent burners. An intimate mixture is effected and flame lengths of from six to twelve feet result. Furnace volumes are reduced to one-third their former size and combustion is even more complete.

Increase in Heat Liberation

The increase in heat liberation per unit of furnace volume leads to the consideration of the limiting factors of this trend. It can readily be seen that furnace temperature, for a furnace of given contour, is a function of

1. Amount of excess air
2. Heat liberation per square foot of projected radiant heat absorbing surface.

Excess air is a measure of the weight of gas to be heated. An increased weight of gas absorbs more heat in raising its temperature than a less weight of gas. Excess air is indicated by the term "$\%CO_2$."

It is also true that, once the absorption limit of the water and steam carrying tube is approached, any increase in heat release per unit of volume reflects itself in an increased furnace temperature. Thus once a definite heat release per square foot of radiant surface is passed the temperature of the gases arriving at the tubes rises above the fusion point of the ash and slagging results. This necessitates the inclusion of additional heating surface in the boiler furnace.

Furnace Water Cooling

The logical place to put additional cooling is on the furnace floor. If the range of operation requires further cooling, the rear or bridge wall and then the two side walls may be partially or totally cooled, according to requirements. It is well to remember that, if ash can be removed through front ash doors, the water floor tubes can be extended up the rear wall to terminate in a conveniently placed header. This procedure holds down first cost since it decreases both the number of headers and the length of outside circulating pipe required. It is best to limit the overall length of each tube to twenty-eight feet since lengths longer than this are special, difficult to obtain and carry a heavy penalty which would serve to balance out the other savings effected.

Another method of ash pit cooling is the water screen. The tubes are uncovered and are spaced on convenient centers to avoid ash bridge formation. The intention is that the ash should pass though the tubes and deposit in the pit, where it would be protected from high temperature griefs by the tubes above. Experience, however, indicates that, particularly with vertical firing, the pit slags and the tubes bridge over as soon as the rating is raised. The extremely high entrance velocities carry the flame below the screen. Carbon deposits on the tubes and is burned in place, resulting in building up until a bridge is formed between the tubes. The flame washing the ash pit slags the ash in place. Horizontal firing is much more successful with the screen in the ability to maintain high ratings without slag.

One particularly attractive and useful feature of the water floor, either with iron plates cast integrally with or superimposed on the tubes, is that steam jets, applied to the flat surface, permit of very close furnace temperature regulation. The accumulation of ash can be controlled to a nicety, permitting it to build up when low ratings are desired and keeping the floor clean when the steam demand is high. Furnace temperature thus can be maintained at the most advantageous value over a wide range of operation. Such cooling, of course, serves to keep the ash at a temperature sufficiently low to prevent the formation of objectionable slag or clinker. The higher the furnace temperature, consistent with granular ash, the more work the exposed radiant surface will do. This reflects itself in reduced flue gas temperatures and increased efficiencies.

Cooling Side Walls

Refractory side walls with water cooling tubes on eighteen inch centres laid against the face of the wall prevent injury to the walls at high ratings and permit a sufficient amount of radiant heat to be reflected from the walls at moderate ratings to insure early ignition and complete burning of the coal.

The maximum heat transfer per square foot of projected boiler tube area is approximately 70,000 B. t. u. per hour. Rare instances are reported where this has been exceeded but these are exceptions due to unusually favorable conditions.

Important considerations in the maintenance of high absorption rates are to make sure that a plentiful supply of water is provided to the headers and that the returns are amply dimensioned. The recent introduction of the recirculation system permits reduction in the size of supply and return pipes. With this system either evaporated make up should be used or ample blow-off provisions made to prevent scale formation from an increase in concentration of insoluble feed water impurities.

If the maximum ratings desired necessitate complete cooling of the side walls, one of four types of cooling should be considered.

Four Types of Construction

(1) Bailey Wall—This consists of standard boiler tubes spaced on convenient centres. Castings are bolted to the tubes. The castings, opposite the ignition zone, are refractory faced while those below the zone are plain. Cement is applied between the castings and the tubes to assist heat transmission. Promising results have been secured with this type of cooling. It is comparatively expensive and, due to the necessity of the heat finding its way through refractory, cast iron, cement and boiler tube, the heat transfer is not very high. The chief advantage is its ability to support ignition at a comparatively low rating.

(2) Power Specialty Wall—The construction is similar to the Bailey excepting that castings are shrunk on the tubes to insure better transfer.

(3) Combustion Engineering Co.—The fin wall construction is comparatively inexpensive, the fins being welded directly to the bare tube. The tubes are not protected and heat, incident on the fin surface, must be transferred through the weld and this, at high furnace temperature, imposes severe duty on the fins.

(4) Furnace Engineering Co.—White iron plates are cast integrally with (pour welded to) the tubes. Expansion joints are left every 6 inches because iron, under temperature, is subject to growth. These joints soon close and a plain flat surface is presented to the furnace. The heat transfer of this type of construction is high because it is direct and the casting is so shaped as to establish stream line heat flow.

All of the above four types of construction do not require thick refractory wall backing. Any high temperature material can be packed between and behind tubes and the whole casing enclosed. In one or two instances wire mesh has been used to enclose this material and results to date are quite satisfactory.

Papermachine Operation and Stock Hydration*

By Harry Williamson, Champion Fibre Co. Canton, N. C.

It is not the purpose of this paper to deal with the question of the hydration of the fiber from the purely technical point of view, but rather with the practical results of hydration, or lack of it, in the running of the fourdrinier machine.

Free Water and Water of Hydration

In discussing the action of the fiber on the wire during its formation into a homogeneous sheet of paper, it is necessary to keep clearly in mind the distinction between water as a suspending medium, or free water, and the water of hydration, that is, the water which by beating and jordaning has become a physical component part of the fiber.

The former is the medium by which we float and suspend the separate fibers until, by the slice velocity and the shake action they are woven together.

We desire to retain such water only until it has completed its service and in the course of this service we want it to drain from the fiber and through the wire gradually, so that when the slice velocity is expended the fibers will be woven together in a sheet of even caliper and density of formation, traveling at the same speed as the wire.

The water of hydration, as a physical component of the fiber, helps retard the drainage of the free water and thereby aids in keeping the fiber in suspension and under the influence of the shake for a longer period; offers resistance to the suction which results in atmospheric pressure on the surface of the sheet, but, it is not removable by drainage, it is only removable by suction, by mechanical pressure applied to the presses and press felts, or by the temperature of the dryers.

A percentage of it, varying from 3 to 6 per cent is a saleable product and a necessary and desirable component of the finished sheet of paper.

Hydration and Fibrillation

Let us briefly review the term hydration.

The term is in itself somewhat erroneous. Webster has it that to hydrate is to form a chemical compound with water.

James Strachan in a brilliant paper submitted before the British Technical Section at Manchester in 1926, contends that the combination is physical rather than chemical and in this he is fully supported by that very able papermaker, R. H. Clapperton.

This writer in a recent nontechnical paper prepared for the use of machine room operatives ventured to describe hydration as the "forming of a colloidal jell round the core of each fiber, the core of the fiber becoming smaller in diameter as the hydration increased."

Hydration can be partially developed by the prolonged saturation of fiber by water. In papermaking it is developed during the beating and jordaning by the constant forcing of water through and into the cells of the fibers.

In the process of fibrillating the fibers, the fibrillæ produced presents an increased area attracting water to the many added surfaces. This water is charged with the finer particles of cellulose, themselves heavily hydrated. The cohesive affinity of these hydrated finer particles to the fibrillæ can not be defined as hydration of the core of the fiber proper, a distinction in terms for the two conditions is necessary. The latter condition may be adequately defined as the leading of fibrillæ with water charged cellulose.

Effect of Hydration in Making Paper

The development of a state of hydration in the fiber costs money in power consumption. The removal of excess water of hydration in the fiber also costs money in felt wear and drier steam.

To what degree then is the development of a state of hydration justified? What degree of hydration is necessary to the successful operation of the fourdrinier machine? Does the development of hydration as such represent the strength of the fiber?

Permit me to deal with the operation of the machine first.

Perhaps if we consider the essential factors necessary to the formation of the sheet on the wire and its subsequent successful running over the machine, we may be better able to find a satisfactory answer to our questions.

1. We must have a mixed volume of stock and water behind the slice, the density of which will ensure the adequate separation of the bundles of fibers into individual units.

2. The flow weight of this volume at the slice lip must be equal to the speed of the wire.

3. The volume delivered from the slice lip to the wire must be sufficient to maintain the fibers in suspension until a homogeneous sheet has been formed.

4. The formation of the sheet presented to the suction boxes must be of sufficient density to obtain the necessary atmospheric pressure on the surface of sheet.

We will take these essential factors in the order named and deal with the relationship of hydration to each of them.

The density of the mixed volume delivered from the screens to the head box is of vital importance to the formation.

Behind the slice we desire the individual separation of the fibers in the suspending medium, water. From the instant the mixed volume is delivered to the wire our whole efforts are concentrated on weaving and interlocking these separate fibers together.

On the one side there is separation. On the other side unity.

The greater the separation the better the opportunity to obtain even unity. If the mixed volume behind the slice is too heavy, the fibers tend to coagulate into bundles and even the most vigorous shake applied to the wire will not cause separation and subsequent individual interlocking of fibers.

The result is a lumpy formation offering uneven resistance to the temperature of the driers. Such a sheet will show damp black spots on the surface with very little calendering.

The separation of the fibers, commenced in the beating, must be finally achieved in the travel of the mixed volume through the sand traps, screens, and head box and is made possible by the use of a sufficient volume of free water.

The greater the hydration of the fiber whilst maintaining the same machine speed, the less the volume of water as a suspending medium used, therefore the heavier the density of the mixed volume delivered from the head box to the slice.

To such extremes do we sometimes carry the hydration of the fiber and consequent curtailment of free water in an effort to increase the pop test, that the whole action of the mixed volume in its travel to the slice is sluggish. This sluggishness not only militates against separation of the fibers, but actually tends to float them together, forming lumps that may result in breaks. On the heavier papers, run at a slower speed and consequently a much heavier density due to basis weight and speed rather than hydration, variation in weight is many times directly traceable to the forming and releasing of pockets of sluggish stock in the delivery system. Hence the necessity on such papers to install extra baffle boards and dams which will permit the use of more free water for separation purposes through the delivery system without being compelled to use the flow weight of this extra water at the slice.

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

"Unless increased hydration as such, does mean increased strength, its use in relation to this factor, the adequate separation of the fibers into individual units is a liability rather than an asset."

Flow Weight and the Volume

Our next two factors, the flow weight of the volume behind the slice, and the volume delivered to the wire as distinct from its flow weight, can be linked together in discussing the relationship of hydration to them.

A sufficient volume must be kept behind the slice to maintain a delivery speed equal to the speed of the wire.

A sufficient volume must be delivered from the slice to maintain the fibers in suspension long enough to get the full benefit of the shake.

These two factors are the most important in the operation of the fourdrinier machine, and their relative value, each to the other is determined and variable in ratio to the degree of hydration developed in the fiber. It cannot be stressed too strongly that the sheet that leaves the couch roll with its perfections and imperfections is fully representative of the quality of the final product.

By juggling press weights, drier temperature, and calendering we may bring out the perfections and to a certain extent mitigate the imperfections, but in the handling of these mechanical units we have a very limited range of possible achievement.

The preparation of the fiber is much more flexible and has a greater range of possibilities. As far as the practical operation of the machine is concerned, the degree of hydration developed in the fiber in the preparation has the greatest bearing on these two factors.

Flow Speed and Sheet Formation

"Stock slow, slices low," is the machine tender's slogan. Flow speed is determined by the depth of head carried and the control of the outlet as represented by the space between the slice lip and the apron board.

As the hydration of the fiber is increased, free water is shut off, the slices must therefore be lowered to maintain the height of head carried.

The net result is heavier density forced through a smaller opening, a smaller total volume delivered to the wire and for the same volume of fiber, a lesser volume of the suspending medium water. In the fiber has been developed a condition, hydration, which will help retard the drainage of the comparatively small volume of suspending water.

The action of the fibers in such a condition under the influence of the shake is vibratory rather than free floating and it is by the cohesiveness of the colloidal jell rather than the interlocking of fibrillæ that formation will be accomplished.

By the resistance of the colloidal jell the heaviest fibers will be prevented from settling to the wire, thus tending to improve the smoothness of the wire side of the sheet. By this same resistance the drainage of free water is slow and while the fibers have at no time since their delivery to the wire, floated free, they maintain their vibratory action right up to the suction box.

Because the fibers are not actually floating as freely as would be possible were a greater volume of free water used, their area of movement after delivery from the slice is extremely limited. This is at once an advantage and a disadvantage. Where the free floating of the fibers while passing over the area of greatest shake action is excessively curtailed, there is a pronounced tendency to form those evils, later developed by uneven shrinkage on the presses and driers, whose inception under these conditions is traceable to an uneven moisture content in the sheet during its formation on the wire; cockling, wet streaks, color streaks.

On the other hand, where the fibers are floating too freely owing to the use of a much greater volume of free water they are the harder to direct and control.

From this cause, while the fibers are most certainly woven and interlaced. the formation will be wild and the distribution patchy. The violence of the rush from the slice would turn many of the finer fibers on end, giving the sheet an unfelted appearance.

In this important phase, the travel from the slice to the suction box, on the making surface of the wire, "hydration as such, when used with discretion, is necessary to the successful operation of the machine."

Free Water and Hydration

From the two alternatives a less volume of free water with fiber of greater hydration, or a greater volume of free water and fiber of less hydration, we can use the advantages of both and discard the disadvantages.

We want the splendid weaving and interlacing results of free floating fiber without losing our control of the volume.

We want the slower drainage of the more hydrated fiber giving us the benefit of the vibratory cohesiveness of the colloidal jell without being compelled to overcome its resistance to the removal of its excess water content. A delivery from the slice of a mixed volume which would keep the fibers in a gradually decreasing suspension for the first six feet of the making surface of the wire and from this point to the suction box sufficiently hydrated to be vibratory under the diminishing influence of shake is the ideal condition to be aimed at for the successful control of these two most important factors.

Density of Formation

The last essential factor, that of obtaining sufficient density of formation to offer sufficient resistance to the suction pumps to obtain the necessary atmospheric pressure on the surface of the sheet, is to be decided by the question, "Of what will this density be composed?" Will it be a closely woven formation of fibers interlaced by fibrillæ with their "water-charged finer particles of cellulose" clinging to their surfaces or will it be by the greater proportion of the colloidal jell of hydration in the core of the fiber?

Either condition will give us the required density, or as we term it in the machine room, the necessary inches of vacuum at the suction boxes or suction couch. While the vacuum as recorded by the gage may very possibly be exactly the same in each method of obtaining this resistance density the operation of the machine is markedly of a different character for either condition

Perhaps in the operation of the dandy we have our best guide. The function of the dandy is to close the sheet and compact the woven fibers together by mechanical pressure. In performing this duty the dandy brings the finer particles of cellulose to the surface.

With either of the conditions of formation we are dealing with there will be enough free water carried to the first suction boxes to lubricate them and run the paper wet to the dandy.

If the density is of the interlacing fibrillæ condition with less hydration of the fiber proper, this free water presented to the dandy will assist in closing the sheet and is disposed of quite easily through the sheet, wire and dandy.

If, however, the density is due to the greater proportion of the colloidial material, that is, excessive hydration of the fibers, the resistance to the passage of water is much greater. The result is seen in the breaks from wet dandy marks which are due to a disruption of the fibers by water under mechanical pressure. Under these circumstances it becomes necessary to suck the sheet much harder before it passes under the dandy and such a sheet will show much speckier than a freer sheet run wet under the dandy.

We have therefore the key word density at both ends of the making surface of the wire to guide us. Behind the slice, density of the mixed volume and at the dandy the nature of the density of formation.

In the operation of the machine, hydration is a delicate tool we can use to advantage according to the grade of paper to be made. Used with discrimination it is an aid to caliper, formation and finish. It helps prevent cockling, yet, used in excess it is the primary cause of cockling.

Hydration and Strength

I think it will be generally conceded that hydration in excess is a liability to the operation of the papermachine. If this conclusion be correct there is only one permissible reason for the excess development of hydration and that is if this development gives added strength to the fiber.

We are therefore confronted with the following problem:

Is the development of hydration as such, necessary to the production of strength in the fiber?, or, Is the fibrillation of the fiber representative of the strength and hydration incidental to the production of fibrillæ and not a necessity to the development of strength in the fiber?

If we believe the former then the machine speed, head box, aprons and slice adjustment must be arranged to permit the use of sufficient water to give adequate separation of fiber and yet allow for the removal of excess water which has become a physical component part of the fiber.

If we incline to the latter then in the cooking of the pulp we must endeavor to produce a fiber which will enable the beaters and jordans to perform their duties of separation, softening, and fibrillation of the fibers with only the desirable degree of hydration.

The preparation of sulphate pulp for kraft papers is an outstanding example of this latter condition and it must be remembered that kraft is the strongest of our wood papers.

A soft kraft pulp with a high yield from the digesters and a small amount of screening usually means a fiber susceptible to hydration to the almost total impregnation of the fiber by water before sufficient fibrillation has been achieved.

The resultant sheet shows a close formation, is considerably harder to dry, shows a strong tendency to cockling when run at high speed and has a low pop test. It has been rightfully said that kraft paper is made in the digester. By accepting a lower digester yield and a greater amount of screenings which can be suitably used, a fiber is produced which permits the beaters and jordans to accomplish fibrillation with lesser hydration.

In closing I would like to leave this thought for your consideration. Strength is due to the interlacing and weaving of the fibers together by the mechanical features of the machine while the fibers are in suspension in water.

This is made possible by the development of fibrillæ. The cohesive affinity of the water charged finer particles of cellulose to the increased surfaces of the developed fibrillæ is incidental to the resultant strength and is not the cause.

Perhaps if we adopt the slogan fibrillation before hydration we will improve our results.

The degree of hydration is that degree which is incidental to the fibrillation of the fiber.

The Harvey-Lewellen Caliper Control*

Tom Harvey[1]

Machine tenders who are running machines making heavy board paper, know that the heavier the board the more difficult it is to produce the board at a uniform thickness. On all machines making heavy paper, this is one of the most serious problems with which we have to contend, and it is becoming more and more serious. The box makers and the users of heavy boards are demanding a sheet that can be used for high grade printing and lithograph work, and also on automatic machines that are so delicate that they will not work properly if the thickness of the board varies in the least from that desired.

Recording Caliper Developed

Some ten years ago, we had a machine that was making board that we thought was as uniform in thickness as it was possible to make it, but every once in a while a customer would complain of variation in caliper. Although we kept samples every half hour as the board was being made, we had no positive proof that the caliper did not vary, and periodically we would have to remake an order or make an allowance in order to get the customer to keep the board. We therefore decided to make a recording instrument that would give use a record of the thickness of the paper as it was being made, and after we had this instrument installed on our machine, we very soon found out that an order that ran uniform for caliper was the exception rather than the rule. We learned that when we were making rolls, our machine would speed up from 5 to 10 feet per minute every time we changed rolls and every time the screen boy raked a screen the caliper would jump up about four points; also, when the backtender oiled the machine the caliper would change. This instrument helped us to solve these problems and straighten out our machine so that the board would run more uniform for thickness.

Automatic Control

We then conceived the idea of installing one of these instruments at the wet end of the machine, connecting it with the stock box, and having the instrument control the thickness of the board as it was being made. For the past two and a half years we have been doing this very successfully on board from 0.010 to 0.50 inch in thickness.

This instrument has the appearance of a large micrometer and is usually installed between the last press roll and the first drier. This is done to eliminate the possibility of making the machine full of paper before the thickness is checked, and in some convenient place that can easily be seen is installed a signal box that contains three lights, red, white, and blue in color. When the paper is on the machine and the instrument adjusted for the required thickness, the white light shows. If for any reason the paper varies 0.001 of an inch on the thick side, the red light shows and the instrument is so constructed that if the red light stays alight it will turn off stuff at the stuff box every three or four minutes until the board becomes the proper thickness. This operation is reversed if the paper for any reason becomes thin.

Advantages Outlined

This instrument installed on a machine relieves the machine tender of the nervous strain brought on by trying to keep the paper to the required thickness, and enables him at a glance to tell if anything is going wrong on the machine, for if the red and blue lights are flashing on and off periodically he knows something is causing the thickness to vary, and he can very quickly find the trouble. If the white light is on he can rest assured that the caliper is running uniform, and can give all his attention to the running of the machine.

In trying out this instrument we have purposely installed it on what we consider the hardest machine to regulate, and in every instance the purchaser has been more than satisfied, reporting that the paper runs perfectly for caliper, and the machine produces more paper on account of the absence of broke and uneven calipered board. One customer after trying one on a machine making very heavy board, ordered four more instruments, which I think is the best kind of proof that the instrument is doing the work satisfactorily.

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

[1] Member TAPPI. Gardner & Harvey Co., Middletown, Ohio.

The Rod Mill in Preparation of Wood Pulp*

By E. F. Stemmler, Allis-Chalmer Co., Milwaukee, Wis.

An unusual amount of interest is being shown in the application of the rod mill in the paper industry as compared to the old method of beating pulp in a beater, and it seems to be the universal opinion that there is room for improvement along these lines as a satisfactory solution of some of the difficulties.

The rod mill as used for beating pulp is a machine similar to that commonly used in the ore grinding industry for about ten years. It consists of a hollow shell and rotates about its long axis placed horizontally and is fed and discharged through hollow trunnions which form the supports at each end. It is charged with rods about 2 inches shorter than the inside length of the shell. The shell is nearly half filled with rods which lie loose and roll or tumble with the rotation of the shell in a horizontal position, thereby beating the material that is fed in through the trunnion.

The operation is continuous and any materials, such as semi-chemically treated chips, screenings or pulp stock being fed to the mill is beaten or disintegrated and then discharged through the opposite trunnion, depending entirely on the rate of feed.

The Lining

The rod mills used for beating of kraft pulp, chips and screenings are ordinarily lined with hard iron wave-type liners, and charged with high carbon steel rods. A backing of rubber has been used to advantage to act as a cushion to take the impact of the rods as they tumble or cascade when the mill rotates on its axis.

In the event, however, that the stock has a slight trace of acid, or when operating on bleached stock for the production of white paper, rubber lining and a special rust resisting material for rods have been used to prevent contamination or discoloration of the paper which is liable to occur with iron linings and high carbon rods due to the action of the acid on same.

The rods mills are necessarily built exceptionally heavy to withstand the rod action, and our long experience in building mills for ore grinding in the mining industry placed us in a position to work out the application for paper pulp work advantageously for that industry.

History of the Application to Paper

In connection with the above description of the rod mill we shall endeavor to give you a little history of its application to paper mill work so that you will have a complete understanding of what has been done along this line up to the present.

Some four years of experiments have been conducted in connection with Forest Products Laboratory of the United States Department of Agriculture, with the idea of improving present beating methods in paper mills.

Due to the great variety of papers made in the mills throughout the country, and the variety of woods which are used in making the various papers, it has been rather slow work to collect the necessary data from which to draw conclusions. Laboratory work of this nature is comparatively slow for numerous reasons, but withal we believe that the work has gone ahead as fast as could be expected.

Fletcher Paper Company

The first commercial installation was made in April, 1925, by the Fletcher Paper Company at its mill at Alpena, Michigan. This installation was made on the strength of tests which were run for the Fletcher Paper Company on its own particular pulp. Various beating tests were made and the beaten pulp was made into paper which so impressed them with its appearance and strength that it was decided to make an installation of a 5x10 foot rod mill. The paper machine with which the rod mill now operates was originally supplied with pulp by three beaters; one beater was taken out to make room for the rod mill and the pulp is now prepared in two beaters and the rod mill.

The pulp at the Fletcher Paper Company is brought to the beater room in the form of laps, and these are broken down and beaten in the two beaters and from there it is dropped into a stock chest from which it is pumped up to the rod mill and hydrated at a consistency of about 2½ per cent as it passes through the mill. The pulp is subjected to a very intense hydrating action imparted by the rolling of the rods, and the paper resulting shows greater strength, has a far better appearance, and forms on the machine much better than before the rod mill was installed. Due to the circulation of pulp and this particular installation it was difficult to determine the exact capacity of the mill but at present from 15 to 30 tons are being hydrated in the mill every 24 hours. The tonnage varies according to the grade and weight of paper being produced. Numerous grades of paper are made at this mill from bleached and unbleached sulphite pulp.

The present status of the Fletcher installation is that the operators are very well pleased with the results obtained. It has not been determined exactly what horsepower per ton is required as compared to a beater, as the work being done by the two types of machines is quite different; but it appears that with the 50 hp. motor which is operating the 5x10 mill, the horsepower required is considerably below that required for a beater to accomplish the same amount of work.

While the installation referred to was being made, laboratory work was going ahead with various other experiments, and as the result of some of these experiments the Southern Extract Company at Knoxville, Tenn., decided to install a 6x12 rod mill.

Southern Extract Company

The Extract Company has been a producer of tannic acid from chestnut chips for several years and the chips from their plant were either thrown away or used under their boilers.

With the idea of making paper from the extracted chips the experiments were started and it was found that a grade of paper suitable for corrugating could be obtained by giving the chips a short cook in rotary digesters and breaking them down in the rod mill.

The rod mill was installed and proved to be satisfactory from the start. This mill was fitted with iron liners as the problem of iron contamination was not important since a dark product would be made any way. For the same reason high carbon steel rods were used. This installation operated about eight months when a second 6x12 rod mill was installed. Each of these mills had a capacity of about 1,400 pounds of chips per hour and the pulp is then brushed up in a jordan before going to the paper machine. The pulp is refined at a consistency of about 8 per cent.

Champion Fibre Company

At the Champion Fibre Company, Canton, N. C., two 6x12 rod mills have been installed and operating for the last six months on sulphite screenings and refining pine chips. A third mill is under construction.

The rod mill operating on screenings is something worthy of consideration, as in some cases this material has gone to waste. The capacity for the rod mill operating on the screenings varies from 5 to 8 tons in twenty-four hours, depending on the feed.

Carolina Fiber Company

The Carolina Fiber Company, Hartsville, S. C., have installed two 6x12 rod mills and have been operating on a semichemical process to refine gum wood chips with very satisfactory results. The capacity of each of these mills is approximately 7 to 8 tons in twenty-four hours.

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

The Tomahawk Kraft and Paper Company, Tomahawk, Wis., have installed one 6x12 rod mill and are operating same on pulp of the kraft process, in the capacity of a beater.

The prepared slush stock of about 4 per cent consistency is being pumped to a box at the feed end of the rod mill and by means of a screw feeder is transferred into the mill. The discharge of the mill is emptied into stock chests and from this point the stock is again pumped into the regular equipment consisting of two beaters and three jordans. The rod mill ahead of the beaters has given such satisfactory results as added beating capacity that one of the above mentioned jordans has been eliminated from service and the kraft paper has a better appearance and is much stronger than before the rod mill was used. In view of the above a considerable saving of power is effected, as a 350 hp. motor is idle compared to the 100 hp. motor required operating the rod mill. The capacity of this rod mill is approximately 40 to 50 tons in twenty-four hours.

The Thilmany Pulp & Paper Company, Kaukauna, Wis., has recently installed and is operating one 4x8 rod mill. The data on this mill are not available as it has been in operation a very short time.

The Bogalusa Paper Company, Bogalusa, Louisiana, have ordered one 3x6 rod mill as an experimental mill used on the kraft process. It should be in operation in the near future.

The National Paper Products Company, Stockton, Calif., have ordered one 6x12 rod mill to be used for refining pulp stock. It should soon be in operation.

Each of these mills is equipped with Wuerst gears and a slip ring motor and is direct connected to its motor through a single reduction enclosed speed reducer. A speed reducer is necessary on direct connected mills for this work on account of the slow speed at which the mill is operating.

The rod mill when operating as a beater or refiner must not rotate too fast, which would cause the rods to drop rather than roll down the surface of the rod bed. When operating on fibrous material sudden blows are to be avoided, but a rubbing or pounding action, which comes from the rolling of the rods over each other gives the desired result.

A feeding device should also be used that will insure positive transfer of the material to the interior of the mill, and a screw feeder has given very satisfactory results.

There is no adjustment to take care of on these mills and the degree of hydration is controlled entirely by the rate of feed. The material discharges from the mill only as fast as it is fed in, therefore when the feed is cut down it means that the material takes longer to pass through the mill and has been subjected to greater hydration than when the rate of feed is increased and the material is passed through faster.

The amount of water being taken to the mill is another important feature, as excess cutting action is liable to occur with a too dilute consistency of stock. On the other hand, too dense a consistency would provide too much of a cushioning effect, so that the rod action would not be efficient. An average consistency, between 4 and 8 per cent, insures good operation.

The size and weight of the rod charge must be governed by the work to be done, as different materials require more or less pounding or beating to obtain good results.

As there are so many varieties of wood and so many variations in the application of the rod mill in connection with the paper industry, it becomes apparent that a great deal depends upon its particular application to the existing conditions in each case to obtain the best results.

In summing up, it appears that the rod mill has a better hydrating action than the old type of beater; it is fed continuously and therefore eliminates the batch operation, and the power requirement is apparently less than that required for the beaters. It is also capable of working up pulp from partially cooked chips, which can not be done economically in a beater.

Ground Wood Pulp*

By George K. Walker—Finch-Pruyn, Inc.

As you all know, previous to 1910 the groundwood end of a paper mill was very much neglected and was left mostly up to the pulp maker and, usually he would give us a different quality of pulp not only every day but it would usually change several times in each twenty-four hours.

Somewhere around 1910, Mr. Frank Holbrook took charge of the Great Northern mill at Millinocket, Me., where they had eight 152 inch machines in one room. When Mr. Holbrook came on the job he found the eight machines would usually run good about three days each week and the other three days it was a broke factory. He found they were making good pulp about three days each week and a small quantity, and poor pulp and lots of it the other days.

After some study, Mr. Holbrook found by using a threaded burr with 10 threads to the inch, he could make fairly good quality of pulp and get a fair production and keep the stock uniform all the time, and, immediately, the paper machines ran good six days per week instead of three and I believe there was about the beginning of making uniform pulp on a large scale.

About 1914, Mr. E. M. Hall and Mr. Ward—who were working in the St. Regis Paper Company mill—found, by using a left hand spiral burr with teeth three-quarters of an inch apart and then a right hand spiral burr with 8 teeth to the inch over the coarse burr, they could make a very long fiber pulp which enabled them to reduce the amount of sulphite necessary to make good news print paper but, with this combination of burrs, it was very difficult to keep the pulp uniform owing to the surface of the stone being so rough by crossing one spiral burr over another. When the pulp was too coarse and the waste too great, they used a brick to dull the rough edges which gave very unsatisfactory results as the brick not only knocked off the rough edges but, at the same time, it glazed the stone so it needed to be sharpened again. Therefore, there had to be a substitute for the brick and, after much experimenting, Mr. Ward found by using a fine diamond point burr with 14 points to the inch in place of the brick, it did not glaze the stone. But, by using one left hand spiral burr over the right hand spiral burr, it left the surface of the stone in a very ragged and rough condition and the waste was still prohibitive.

As soon as my pulp maker and myself saw them using the dull diamond burr for dulling the stone, we conceived the idea that using this burr sharp and running it over the face of the stone very quickly we would keep the stone from becoming glazed from constant action against the wood being ground. But, we found by using the fine diamond burr alone the pulp was too short and coarse and to overcome this we used a No. 4 straight cut burr to make creases in the stone to drag or carry the coarse fibers which were ground in one pocket to and under and between the wood and stone in the next pocket. These creases also helped to carry some of the shower water around the stone, which eliminated a chance of the stone becoming burned when running the stock hot and heavy.

After using this method for fourteen years, I am convinced that it is practical and as near fool-proof as any method so far known. With a stone speed between 210 and 225 r.p.m., with stones from 54 to 60 inches in diameter, using a pressure of around 32 pounds per square inch, one can make the best quality of groundwood pulp with 50 hp. per ton. I believe the customary

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927. (Abstracted.)

speed of the magazine grinders in this country is 240 r. p. m., which necessitates using a very hard stone and hard stones usually have fine grit. The Oji Paper Company, of Japan, have two Warren Caterpillar grinders running at 225 r.p.m., and they are using the No. 4 straight cut burr with a No. 12 fine diamond point burr and they are making pulp with 53 hp. per ton, and the pulp is of a quality which allows them to run their paper machines 750 feet per minute with 21 per cent of sulphite, making 28-pound news print.

It has been demonstrated beyond any doubt that good news print paper can be made as follows, if the groundwood is made properly:

Machines running up to 500 feet, 5 per cent sulphite; from 500 to 600 feet, 10 per cent sulphite; 600 to 650 feet, 15 per cent sulphite; 650 to 750 feet, 18 per cent sulphite.

Now, if this is true, how will we make groundwood pulp fine enough and long enough to make good paper at these speeds and percentages of sulphite? Very simple. Speed of stones should not exceed 3,350 feet, surface speed. Surface of stone should be treated with a straight cut or spiral burr with very slim, sharp teeth—4 teeth to the inch—this being as close as the ordinary stone will hold up between the creases. If these creases are closer than one-quarter inch the stone breaks down between the grooves and tends to make slivers and waste. After these creases have been put in the face of the stone, a No. 12 or No. 14 diamond point burr is used very lightly and often to keep cutting surface of the stone smooth and sharp at all times. After a stone has been treated in this manner, use just enough pressure to get production, which on a pocket grinder, is between 55 and 60 pounds pressure, with a 14-inch cylinder.

Good groundwood pulp can be made with this system with as low as 45 hp. per ton, with very little waste and by using a freeness tester and blue glass it is very easy for the pulp maker to keep the groundwood pulp so uniform that the papermakers will not be able to detect any variations in the freeness over a long period of time. In other words, the pulpmaker can detect and control freeness variations which are so slight that the papermakers can not detect them when the stock reaches the paper machines and the maximum production of pulp is being produced at all times.

If there is any better method of making groundwood pulp, the writer has been unable to find it after constant effort during the past fourteen years.

Avoid Waste in Making Ground Wood*

By Levi A. Fralick, The Algonquin Paper Corp., Ogdensburg, N. Y.

I am not going to tell the superintendents of the hundreds of mills just how they should make pulp for each individual mill, as that can not be done by any one man. But what I consider most important is, that every mill manufacturing groundwood pulp is having a greater waste from the log to the finished sheet of paper than they should have.

Let us start with the saw. If the saw is not sharp and it has too much set, it cuts too wide a gap, and also breaks off and pulls out long chunks of wood that go to waste as it is cut.

Then come the grinders. Nearly every manufacturer of grinders will ask you what length wood you are to grind, and if it is 24 inch they will build a pocket that will take in 24½-inch wood. Most sticks fill the pocket the entire length of the pocket, leaving no room at either end of the pocket to let the stock pass out, only the opening left between the end fingers.

If a grinder pocket is made so it is 3 inches or 4 inches longer than the stick of wood, the stock will pass the ends of the wood and drop down in the pit and is not constantly being carried around and reground. Therefore, the amount of flour caused by being reground is much less and there is not so much loss in the white water in the groundwood mill or on the paper machine.

One other point that is overlooked by so many mills is the dams. They should be so constructed as to allow a free and easy flow of the stock from the grinder and not cause the stock to pile up against the stone. The more stock carried around the stone the more power it takes to make a ton of pulp.

In starting a line of grinders (motor-driven) did you ever notice the difference in the power it requires to start the line when free from stock or with the stock up to the shaft in the grinder pit? If it requires more power to start it also requires more to keep the stone running, and if the stock is carried in short, high dams it must be carried around the stone, causing it to be reground, therefore, causing waste. The hood, that is, the covering over the dam, has a lot to do as to the stock being constantly kept against the stone. If they are so constructed that they keep the stock piled up close to the stone they also cause the stock to be reground. They should be high enough to let the stock pass under them, and an opening or air space between the hood and the stock in the dam to allow a free circulation of air. This helps to keep the temperature of the stock much lower and eliminates a greater part of the steam that otherwise comes from the grinders.

Sharp burrs should be used and stones must be kept trued up, as a stone kept in shape lasts longer than one that is not kept in shape; pockets kept close to the stone to keep slabs and slivers from passing through; bolts and castings kept tight; shafting in line.

I have had several mill men ask how often a stone should be burred or dressed. In reply I would say that there are so many grades and qualities of stone used that the only thing to do is to watch the stock very closely from each grinder and if it begins to make slivers it should be dressed, or, on the other hand, if it begins to make a fine floury pulp it should be dressed or burred. Some stones break away and leave a coarse, rough surface that tears the wood off in coarse slivers and the greater part of the wood goes out with the tailings, or rejections, from the screens. Some stones do not hold an edge and soon become smooth, making a fine, floury substance, (not pulp) which goes away in the white water. Some stones require dressing more often than others.

It is very important that the quality of pulp from each grinder should be watched very closely to see that the required grade is being made from each and that there is the least possible loss either in slivers or flour because we do not only lose the wood but the cost of the power and labor as well.

Most mills average their groundwood production to the total number of stones and do not trace the cause of one or more not coming up to the average, or one or more being higher than the average. In either high or low production there may be a large loss.

Screening of groundwood pulp is also being overlooked in some mills. There is not enough screening capacity and too much groundwood is forced into the screens with too small an amount of water. In this case a large amount of pulp is forced out as rejections and is lost. In most instances it is the grade of pulp that you are looking for, to make that grade of paper you want. In other mills they have plenty of screening capacity but lack the required amount of water for the stock. In this case they get the same results as the mill which lacks screening capacity.

I have also been asked concerning the amount of water it requires to screen a ton of groundwood pulp to receive the best results. It requires from 68,000 to 70,000 gallons per ton. I will say that when our mill first started we were using 60,000 gallons of water with ten to twelve per cent of screenings. We raised it to 72,000 gallons per ton and we have less than 2 per cent of screenings.

I think the closed system is the only thing, but if there must be some white water getting away, then use some good type of save all.

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927. (Abstracted.)

Bleached Sulphate Versus Sulphite Pulp*

By H. A. Helder[1]

In leading up to the use of this sulphate pulp in the paper mill, it may be of interest to recount briefly the study made on the production of the pulp and its peculiar properties.

This problem was first approached in the wood yard and after considerable experimenting, first in a laboratory digester and then in a large mill digester, we decided upon the selection of wood most desirable for the production of this grade of pulp. The size of the chip used for digesters was carefully followed as well as the composition of the cooking liquid, relation of liquor volume to wood and the cooking time.

This step probably caused more concern than any other phase of the problem, because it is a known fact, common to all pulps, that at this point in the operation all previous precautions and vigilance can be undone within the space of a very limited time.

The problem was approached from these four angles:

1. Low density bleaching (cold) ..... 80°F.
2. Low density bleaching (hot) ..... 110°F.
3. High density bleaching (cold) ..... 80°F.
4. High density bleaching (hot) ..... 100°F.

Following are strength tests of the bleached pulps, temperatures of bleaching, time in contact with the bleach liquor and the densities at which pulps were bleached:

Sample No.	Time of bleaching	Temp. of bleaching	Density of stock	Strength of Pulps 70 min.	80 min.	90 min.
	hr.	°F.	%	%	%	%
1	8	80	4	216	234	218
2	2½	110	4	232	240	236
3	4	80	10	232	235	232
4	1	100	10	216	222	221

These strength tests were made following the routine method as prescribed by the Forest Products Laboratory, and given in terms of per cent. based on regular bond basis—17x22x500 sheets per ream.

It is interesting to note the following points:

(1) The uniformity of maximum strengths obtained by proper control of the bleaching process, regardless of method employed in bleaching.

(2) The high strength obtainable on the pulp.

(3) The point of beating at which the maximum strength is obtained.

From the study made on the ball mill tests, it appears that the strength of the pulp compares favorably with that of the standard sulphite pulps; differing in this respect, that the sulphate pulp requires a little longer beating time, but a much lighter beating than a sulphie pulp. In the handling of the sulphite pulp in the ball mill it has been our experience that the maximum strength is reached in 50 to 70 minutes depending upon the methods employed in cooking and bleaching the pulp and the kind of wood used.

As a matter of information and for comparison purposes a number of alpha determinations were made on the sulphate pulp which were plotted against those obtained on sulphite pulps.

The average range of alpha content of the pine sulphate pulp was found to run between 79 per cent and 83 per cent, while that of the sulphite pulps ran within a range of 82 to 87 per cent, indicating a close resemblance in the two kinds of pulp.

As a further comparison both the hot water solubles and alkali solubles were determined with the following results:

Sulphate Pulp

(1) Hot water solubles — %
Average for five pulps 1.22
Range ..... 0.9 to 1.6

(2) Alkali solubles
Average for five pulps 12.60
Range ..... 10.1 to 13.2

Spruce Sulphite Pulp

(1) Hot water solubles
Average for three pulps 0.91
Range ..... 0.71 to 1.20

(2) Alkali solubles
Average for three pulps 9.95
Range ..... 8.8 to 11.2

Hemlock Sulphite Pulp

(1) Hot water solubles
Average for three pulps 1.00
Range ..... 0.85 to 1.2

(2) Alkali solubles
Average for three pulps 12.4
Range ..... 11.2 to 13.25

As was anticipated, a slightly higher figure was obtained in both the hot water soluble and the alkali soluble of the sulphate than of the sulphite pulp, which also is indicated by the alpha determinations. This fact can be attributed to the bleaching operations and may later be overcome.

Thus far an attempt has been made to cover the most important factors which enter into the production of a sulphate pulp which may be substituted in many papers for sulphite pulp.

Following are some of the figures and observations which were made during a trial run of sulphite pulp on a 168 inch machine.

The stock was furnished to beaters in roll form and carried at a consistency of approximately 7 per cent. The beater rolls were first set so as to give the stock a medium heavy brush and worked for one hour before dropping to the stock chests.

This treatment, however, proved to be too harsh; so the beater rolls were raised slightly and the stock given one and one-half hours of work in beaters, which plan of operating the beaters gave very satisfactory results on the machine, and was used thoughout the run.

The acidity tests were watched very closely throughout the making of each beater and on to the machine wires. It might be well to state that the white water system is practically a closed one, and doubtless required a little more control work than that of an open system.

Following is a set of average readings in beaters:

pH. value of stock to beaters 6.8
pH. value of stock in beaters, 7 per cent consistency..... 6.0
pH. value of stock in beater after addition of size 6.4
pH. value of stock in beater after addition of alum 4.8
(Ready to drop to stock chest)
pH. value of stock in machine head box from jordans 4.6

The relative percentage of size and alum used per beater of one-ton capacity—40 pounds size, 30 pounds alum.

The stock was passed to the jordans which were arranged in a series of five, three of which were Shartle and two were Noble Wood.

The plugs were set back so that the cutting action of the jordans was just sufficient to help make a good sheet on the wire. The horsepower varied from 97 to 125 hp.

The average consistency of stock in beaters during the test run was 6.61%.

The average consistency of stock from jordans 5.50%
The average temperature of stock to jordans ..... 65.0°F.
The average freeness test of stock to jordans ..... 602 cc.
The average freeness test of stock from jordans ..... 410 cc.
The average temperature of stock from jordans ..... 75° to 80°F.
The average consistency of stock to wire 0.51%

Due to the fact that the constant humidity room was not completed at the time the test runs were made, no records are available on folding qualities, tensile strength, or tear tests of the finished paper made from this pulp.

The speed of the machine varied from 500 to 600 feet per minute, depending upon the weight of paper made.

The Mullen tests on the finished paper averaged from one to one and one-quarter points per pound, calculated on the regular bond basis, 17x22—500 sheets per ream.

The result obtained throughout these test runs with bleached sulphate pulp compare most favorably with an average sulphite pulp and undoubtedly indicate that the former can be substituted for the latter in many respects to considerable advantage, both in quality of resulting product and cost. The merits of properly made bleached sulphate pulp will commend themselves to the papermakers in search of quality at a reasonable cost figure.

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

[1] Member TAPPI. Chief Chemist, Champion Fibre Co., Canton, N. C.

CO_2 Recorders*

By M. F. Corin, Permutit Co.

A great number of different makes of automatic CO_2 recorders are based on the Orsat principle. They are usually driven by water pressure or electric motors, and make on an average 20 analyses per hour. The most noted instruments of this type are made by the Foxboro Co., The Hays Corporation, the Republic Flow Meters Co., and the C. J. Taghiabue Mfg. Co.

In the Uehling CO_2 recorder which also belongs in this group of chemical instruments, a somewhat different principle is used. A continuous current of the gas to be tested is passed through a chamber filled with caustic potash flakes. Due to the absorption of the CO_2 by the caustic potash the specific volume of the gas sample is decreased, thus causing a drop in pressure in the absorption chamber which is used as the means of indicating the CO_2 content.

Electric CO_2 Recorders

The principle of electric CO_2 recorders which were developed more recently is based on the thermal conductivity of gases. An electric current is caused to flow through two platinum wires arranged in a Wheatstone bridge circuit. One wire is in a chamber into which flue gas diffuses and the other in a chamber containing atmospheric air. The heat generated in the wires, by the current, is transmitted through the gases to the walls of the chambers, and as gas containing CO_2 transmits the heat less readily than the air, the wire in the gas chamber becomes hotter than the one in the air chamber. This causes a corresponding change in resistance of the platinum wire which unbalances the circuit and causes a deflection of the galvanometer to an extent depending on the percentage of CO_2 present.

Electric CO_2 recorders are sold by the Bachrach Industrial Instrument Co. (Siemens and Halske Type), the Brown Instrument Co., The Cambridge Instrument Co., C. Engelhard, Inc., and the Leeds and Northrup Co. The various instruments differ somewhat in design but the general principle applied is the same in all of them.

CO_2 Recorders Based on Gas Density

The specific weight of flue gas increases in proportion to its CO_2 content. CO_2 being about 50 per cent heavier than the other constituents of the flue gases. This fact was used as the basic principle for CO_2 recorders as early as 40 years ago. Such gas balances were designed by Lux, Arndt and others, but since the specific weights of gases are very small, these instruments were so delicate that satisfactory results could not be obtained under the severe operating conditions of the boiler room.

Ranarex CO_2 Recorder

In 1923, the Ranarex CO_2 Indicator and Recorder was placed on the American market by The Permutit Company and in this machine these difficulties have been overcome. In order to obtain a substantial force as a means of measuring the specific weight of the gas, a rotating motion is imparted to the flue gas by means of a motor driven fan revolving in a chamber. This fan drives the gas against the blades of an impulse wheel located opposite the fan in the same chamber and thus produces a torque on the shaft of that impulse wheel, this torque being proportioned to the CO_2 content of the flue gas.

In order to eliminate the influence of changes in fan speed, temperature, humidity and atmospheric pressure, a comparing torque is produced on another impulse wheel by air to which a rotating motion is imparted in a second chamber by means of a second fan driven by the same motor. This fan, however, rotates in the opposite direction to the flue gas fan.

The two impulse wheel shafts are coupled together by means of two levers, and a connecting link. The coupling system prevents complete rotation of the impulse wheels, but the difference in the two opposing torques causes a limited movement of the system which is transmitted to a pointer designating the figures on the scale calibrated in terms of CO_2 content of the flue gas. At the same time a clear record of the results is made on a strip of paper by a series of perforations, the recording device also being driven by the motor.

The gas is drawn through pipe line at a high rate of flow and since no time is required for chemical reactions or gas diffusion, the reading is instantaneous after the gas enters the instrument, and the total time lag is therefore negligible. With the reading appearing on a large, clearly visible scale and without appreciable time lag, the fireman has a practical guide which enables him to regulate the air supply properly instead of depending upon his interpretation of flue gas conditions that changed several minutes before.

It is apparent that the entire instrument is made up of simple, rugged, mechanical parts; a motor, two impellers, two impulse wheels and a coupling system. A durable, dust-proof aluminum casing encloses the entire machine. The instrument is mounted in the boiler house where it is easily accessible and in full view. The scale and paper record are illuminated by a lamp attached to a swinging bracket.

The gas is drawn from the flue ahead of the damper and passes first through a porous filter where the suspended particles are removed before the gas enters the pipe line. The moisture which condenses from the gases upon cooling is collected in the water-legs. The gas then passes through the steel wool filter and the cotton filter and thence through one compartment of the double humidifier, where it is brought to the same temperature and degree of humidity as the comparing air which passes through the other humidifier compartment simultaneously. The humidifier is merely a container of water with a gas-tight dividing wall, the gases passing over the water surfaces. After leaving the humidifier the flue gas passes through the flue gas chamber, whence it is exhausted to the atmosphere. The air, in the meantime, is circulated continuously through its humidifier compartment and the air chamber.

The pipe lines from the flue are ½ inch. The passages in the machine itself are also large, and it is therefore evident that there are no small orifices which are readily clogged.

A permanent compressed air connection is provided so that the soot may be blown off the porous filter conveniently at regular intervals.

In this connection it might be mentioned that the Ranarex principle lends itself to many other uses wherever the specific gravity of a gas gives some information as to operating conditions. Thus it is possible to determine the density of illuminating gas, the ammonia content in ammonia-air mixtures and the moisture content of air used in drying processes. It is of especial interest to paper manufacturers that a Ranarex SO_2 Indicator and Recorder is being developed at present.

It is apparent that the principle embodied in the Ranarex permits a construction which is both sensitive and rugged. The component parts of the machine such as a motor, bearings, etc., are well-known and fool-proof, so that any operator can quickly learn how to handle the Ranarex properly. Because of sad experiences in the past with complicated and delicate apparatus, many engineers have felt that it was impossible to design a CO_2 recorder which can be successfully operated under practical conditions. Such men particularly are impressed with the design of the Ranarex and the 700 installations made in this country during the past few years, offer ample proof that this impression is correct and that here at last is a practical CO_2 recorder.

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927. (Abstracted.)

An American Paper Coating Clay*

By H. T. Edgar, of The Miner-Edgar Co.

The writer has been requested to prepare a paper for this Convention basely largely on what American clays are accomplishing for coating purposes. On discussing the matter with the authorities at the Bureau of Standards, it was felt that it might be of interest to make this paper a brief historical review of the domestic clay industry from its early beginnings to the present time.

English paper clays are primary (or residual) in character, and are found overlying or in close association with the rocks from which they have been derived, but it is recognized that American paper clays are secondary (or transported) in character, that is, they have been carried some distance away from their point of origin.

Early American Clay Washing

During the period 1875-85, three or four progressive clay miners in the South Amboy, New Jersey, clay district, erected clay washing plants to remove the impurities from a fairly white clay occurring in that locality. The product was called "New Jersey washed ball clay" and was largely sold to the potteries, a small portion going to the paper trade.

It is interesting to note that one of these pioneers in American clay washing was Charles S. Edgar, who was the founder of our companies and later applied his genius to the washing of the whiter clays of the South.

During the next few years clay washing operations were applied to the rather restricted residual deposits of Delaware, Maryland and North Carolina. Most of the product was sold for pottery purposes, the North Carolina plants still constituting an important source of supply for that trade. In 1892, at Edgar, Florida, the Edgar Plastic Kaolin Company erected a plant which has ever since served the pottery, hotel china, floor and wall tile, and electrical porcelain trades. In none of these plants was the clay produced suitable for paper use.

As far as we have been able to ascertain, the first clays in this country used for filler purposes in a crude state by the paper trade were in the South Carolina territory. One property in this state is said to have operated almost continuously since Civil War days.

In 1909 to 1910, three washing plants were established in the State of Georgia, all of them within a radius of less than thirty miles. The output of each was of necessity very small at the start. Prejudice against American clays in the paper mills was almost universal. Undoubtedly part of this prejudice was justifiable as the preparation of the clay was not as thorough at the beginning as obtained in the preparation of English clay. Furthermore, the physical characteristics of the American clays differed from the English product, requiring variation in treatment in their use.

American Producers Encouraged

Very early in the history of the Georgia plants, one of the largest paper mill organizations in the East recognized the value of encouraging American competition and placed considerable business with American producers. At this time, the writer wishes to express his deep appreciation to this concern for their cooperation and encouragement.

Had it not been for such encouragement, when the World War cut off the supply of English clay, American producers would not have been as well equipped to satisfy the tremendous demand. It would be tedious to recount in detail the numerous times these clays received trial orders, only to be turned down. Then the series of crises arose involving the supply of English clay, each of which crises offered an opportunity for American clay to demonstrate its equality.

Between 1910 and the present day have occurred such emergencies in England as strikes at the clay mines, coal strikes, railroad strikes, dock strikes, boat strikes and finally, and most serious of all, the World War. It may be merely coincidence, but in every one of the operations where a strike occurred, the industry was highly unionized.

As each emergency arose, American paper clays were forced to extend their operations and the paper mills to make a thorough and intensive study of American clays and to adapt their operations to the use of the American clay. It is obvious that to improve such a process or product, it is necessary first to sell it. By the time American paper mills had begun the wide use of American clays, constructive criticisms were offered, and as the producers were reasonably intelligent, conscientious and highly desirous of preparing their clays to meet the most exacting requirements, the result has been that today, American clays are being produced with a lower grit content, lower moisture content and absolutely more uniform than any other clays produced anywhere else in the world.

The Question of Moisture

Take the question of moisture. Reference was made in "Technical Association Papers" of June, 1925, Series No. 8, in a discussion at Coated and Processed Papers Sectional Meeting by Mr. M. L. Griffin as to the method of drying English clays, and he stated at that time that English clay dried unevenly. Their method is known as the "drying pan" system, a term used among American potters. Others designate this system as a "slip kiln." It is generally recognized that where irregular drying occurs in one end of the dryer the clay may be too wet, while at the other end, there is a danger of burning to the point where some loss occurs of water of crystallization, thereby modifying the physical properties, such as plasticity, shrinkage, etc. Also, the thickness of the clay in the slip kiln (12 to 18 inches), is so great as to make for considerable variation of moisture from top to bottom. In the case of American clays, the accepted practice is to dry the clay in a drying shed by exhaust steam over piping, aided by atmospheric evaporation; filter press cakes being much thinner, making easy, uniform drying. The clay is dried to a point where nearly all the free moisture is driven out. American producers all believe that this makes for a very uniform product. Moisture content, which in English clays runs anywhere from ten to fifteen per cent, is less in the case of American clays, which vary between two and six per cent.

At this time, it might be well to ask the question as to what would have happened to prices of clay during the repeated strikes in England, to an even greater extent in the World War and the disorganized period immediately following the War, if American production had not at least partly kept pace with the demands made on it from the American paper mills.

Progress Made by American Producers

American clay producers have not looked for sympathy, but at the same time, we would like to draw your attention to some of the things with which we have had to contend since 1913. First, we had the Underwood Tariff of 1913, cutting the import duties on English clay from $2.50 per net ton to $1.25. We are convinced that if it had not been for the World War acting as an artificial tariff barrier, American paper clays would have been all but wiped out of existence. During the War period, a large business was established among the news mills along the Canadian

* Presented at the annual convention of the American Pulp and Paper Mill Superintendents' Association, Richmond, Va., May 26-28, 1927.

border and in certain parts of Canada, among the book mills of New England and along the Atlantic Seaboard. Due to the manner in which McAdoo administered the railroads of the country while they were under Government control, freight rates were increased to such a point that all of the news business was lost, due to the fact that freight rates were in most cases higher than the price of the clay. Practically all of the New England business was lost and a large part of the business of the Atlantic Seaboard.

With the return of the Republican party to power, a new tariff bill was put through, but due to a combination of lack of initiative, carelessness and over-confidence, clay producers succeeded in having the rate on English import clay restored only to the rate prevailing before 1913, namely, $2.50 per net ton. Meanwhile, the value of the dollar had dropped to between fifty and sixty cents. With rare patience and tenacity, the American clay producer went to work again and built up practically a new business in the Central West and Wisconsin and Minnesota fields.

Since the War, various efforts have been made by the English to recover the markets lost to them during these years. It may or may not be true that an effort was made to buy up the American producers and that when the size of the investment was learned, the effort was given up. On the other hand, there is no doubt that in a more legitimate way, the English have attempted to recover some of this lost ground through efforts to secure freight reductions and to enter the Central West by means of boat deliveries to points on the Great Lakes in Michigan and Wisconsin. The freight rate reduction is based on the brick rate and the Interstate Commerce Commission stated that this reduction should apply to Domestic clays, but so far we have been only partially successful in securing these rates, while they have been granted to the English with very little effort.

Control of English Prices

Since the War, a cartel was formed in England for the control of prices, the direct effect being to sell filler clays comparable to the American product at an extremely low price, the apparent effect of which would be to recover their own business or destroy American competition, as one might choose to view the matter, and at the same time, to maintain very strictly, prices on high grade filler clays and coating clays on which there had been no American competition. These facts and efforts can be confirmed readily by referring to the "Chemical Age," an English publication, with particular reference to the publication of November 21, 1925. The headings in a very complete article were as follows: "Nine Months Trade," "Pre-war Record Nearly Reached," "Good Prospects in U. S.," "Common Clay Production," "Fixing Prices," etc.

It was at this point when efforts were apparently at their height to harass the American producer of paper filler clay, that a proposition came before Ergar Brothers Company to take their Georgia clay, and through a chemical and bleaching treatment, improve it to a point when it would serve American paper mills for coating purposes and also act as a high grade filler.

Although this process was a patented one and the plant was in full operation from the latter part of 1925, it was not until late summer of 1926 that the process had been improved sufficiently so that the clay had reached not only the desired standard for color and uniformity, but that it could be produced in a commercial way so that it could be sold at a price to compete with English clays of a similar color standard. That the results have been obtained is readily shown by the fact that leading paper mills, not only tested out the clay thoroughly in their laboratories, making most rigid comparison with the English product, but followed this by successive mill runs, and in a number of cases put the coated paper through a number of rigid tests, followed by time tests on the paper, and the obtaining of the opinion of the trade using the paper, after which time a number of large representative mills entered into contract on this clay. At the start, it was necessary to proceed cautiously until we had satisfied not only ourselves, but had obtained the verdict of the paper mill user, and so one of our washing plants was adapted to the production of this particular clay. When the verdict was known, it was decided to erect a plant specially designed for this purpose, built in units which could be added to promptly as the demand developed. This plant is now completed and ready to operate.

American Coating Clay

It is necessary for the writer to refer to our own organization because we are (as far as we know), the only corporation producing an American coating clay, and therefore, we hope we will be pardoned for such references.

The writer, and none of his associates, pretend to be paper experts, so we have secured the opinion of some leading authorities on our clay and will take the liberty at this time of quoting what has been said about this product by some of our good friends. In each case, we feel bound to conceal the names of those involved. One of the large users of our "H. T." coating clay reports as follows:

1—It must have a bright color, free from tinting. A good bright natural is generally preferably to a blue white.
2—The clay must run absolutely uniform with respect to color and quality.
3—It must be free from dirt and sharp grit.
4—It must make a free flowing paint when mixed in proportions of 100 parts of dry clay to 140 parts of water, and the equivalent of 15 parts of dry casein, properly cut with alkali.
5—The clay must be sufficiently colloidal to make a color which will spread well on the paper and give an even, smooth, high, finish to the sheet after the latter has ben calendered.
6—It must be free from water soluble chemicals which might cause deterioration of the raw stock or coating material.
7—It must be available, in quantity, at a price which the trade can afford to pay.

I will say that your clay meets enough of these requirements to make it mighty interesting to paper coaters.

Expert Opinion of American Clays

It has been asserted by a mining engineer who has devoted the last few years exclusively to an intensive study of American clays for high grade paper use, both in filler and coating paper, working in one of the very best paper mills in the United States, that as a result of intensive study and experiment, it has been proved by machine runs "that as high as 25 per cent additional clay may be added to paper stock when the clay is of a uniform consistency and the sheet has greater opacity, takes a better finish and the finished sheet carries all the tests and requisites that is intended of it."

"In coating paper, the same applies only more forcibly, for with a very fine uniform base, particles will lie closer and more solidly on the surface of the sheet being coated, will have less light refraction, have greater opacity and will give a higher and better finish after calendering."

In the ordinary washing of domestic clays, it is recognized that the clay should flow with just enough speed to keep the clay in suspension and to drop out foreign matter, to employ a very high volume of water to have the clay flow at such speed that every bit of grit and foreign matter will drop into the troughs, up to a point where anything of higher specific gravity than the clay has been extracted. In the preparation of our coating clay, we start from this point and by a chemical treatment take out practically in its entirety, all other grit and foreign matter and even some of the coarser particles of the clay, which are not as old geologically as the rest of the clay, and also also darker in color, and the resulting product is of an exceedingly great fineness and uniformity, approaching a colloidal clay.

At this point, actual experience shows two results which ordinarily would be contradictory in character. In the first place, it

should be expected that a clay as fine as this should give a very high finish. As a matter of fact, actual mills using the clay state that a higher finish is obtained than in the use of English clay. It is our understanding that "satin white" is used for two purposes, to bring up color and to obtain a high finish. Because of the fact that this clay gives a high finish, less "satin white" is needed, and as "satin white" is so much higher priced than clay, an economy is effected in this respect.

On the other hand, one of the great authorities in the United States has just completed for us a test of four of our American clays and has also tested a number of representative English clays, and one of the conclusions he draws is that our coating clay requires somewhat less casein than did the average of the English clays tested. I am told that ordinarily, where the particles of clay are very fine, more casein would be required. That the reverse is true in this case is curious, interesting, and again from an economy standpoint, of great interest to the paper mill user.

To recapitulate:—

Color

Leading authorities among actual users of this clay, both for high grade filler and coating work, as well as chemists who are considered authorities in the paper mill trade, state that this clay matches the very best English clay for filler work as to color, and beats or equals the lower and medium grade coating clays among the English for coating work, but is exceeded in color by a few of the very choicest and highest priced English coating clays.

Grit

We believe we have demonstrated that we have good reasons for stating that the grit in this clay is reduced to a point never before approached by a clay, domestic or foreign, because after removing all the foreign material possible by mechanical washing, we have removed practically all the remainder thru chemical treatment. In a large mill the economics that should result from this treatment should be appreciable and we would welcome a report from some of our friends as to the actual saving on their wires during the course of a year. We believe it would be found to be very considerable.

Uniformity

We feel we have proven reasons for believing the clay developed by this process should be more uniform than any other clay yet produced.

Moisture

We have demonstrated that by the very methods used among all the leading washers of clay in the Southern field, the moisture content, following American practice, is very considerably lower than obtained by methods used among English producers, and that a fair average of moisture in clays produced in the Georgia field would be a variation between two and six per cent.

Casein Required

We have quoted an authority who would be respected by any one in this room regarding tests made on half a dozen English coating clays, striking an average and then making similar tests with casein on our "H.T." coating clay. The result was that in spite of the fineness of particle in our product, actually somewhat less casein was required to coat a sheet of paper. Quoting further from the same authority—"The value of this casein test to the paper coater is obvious, for casein is a relatively expensive material and it is undesirable to use more of it than is necessary. Also increasing the amount of casein reduces the gloss which the paper will take on calendering and retards the penetration of the printing ink, which is a factor in rapidity and expense of printing."

Satin White and Other Coating Materials

We understand that many coating mills use "satin white" or some other high priced coating material in connection with the clay for two purposes, to get a higher finish and to bring up the color of the sheet. We have been assured by users of our clay that due to the fact that the individual particles of the clay as produced by us are so very fine and uniform, a higher finish is obtained than by the use of any other clay, domestic or foreign, with the result that less "satin white" is required, where one of the objects to be obtained is high finish.

Quality

We are sketching herewith briefly why American clays have had a logical development from the crude state up to the product we are discussing at this meeting. In the order of development of the clay business in this country, and in a perfectly logical growth, we have:—

1. A crude clay which, because of irregularity of the product as it occurs in nature, is limited in its application for high grade use.
2. A clay mechanically washed which we have traced through from its early somewhat unsatisfactory period to the highly developed product which is now prepared by ourselves and our respective competitors for filler use among the paper mills.
3. A process combining the best of the mechanical washing followed by a chemical and bleaching treatment. The resultant product is found to be practically free of grit and other impurities of the same specific gravity, together with a portion of the clay itself which is found to be coarser in nature and of a darker color than the remaining clay. The final result is a clay which is more uniform in character and of the finest of individual particles, characteristics much to be desired in coating work. It is reasonable to claim that a greater control of the uniformity of a clay, both as to color and as to character, can be secured by the use of chemicals, which can be measured with exactness, than to a vast extent would be possible to find in a crude clay, and, to a less but considerable extent, in a clay mechanically washed.

Service

We have enlarged somewhat on the difficulties of getting English clay over to this country by recalling to your attention, the variety of strikes that have occurred over there and the World War, causing clay to move to this country less freely. Nothing has been said previously about the irregularity of service, due to storms in the winter and bad weather, sometimes even to the extent of vessels going down, and in a broad way, it is considered undesirable to draw material from a great distance if a product of a satisfactory nature can be obtained nearby. We believe that in at least some respects the World War was not all a loss and that among other things, manufacturers of all sorts have had their patriotism more fully aroused, and that the paper mills are no less patriotic than other lines of business, and we feel sure that if they can get a product in their own country that is of equal quality to a foreign product and at a satisfactory price, that they would prefer to place their business in the United States.

In connection with this, it is not necessary to enlarge further on the fact that with English clay, it is either a "feast or a famine," with demurrage charges and other things involved, whereas domestic clay can be taken in exactly as wanted and deliveries to almost any point in the United States where paper mills are to be found made in not much over ten days as an extreme limit.

In addition to this, as an organization, we have always featured our storage capacity, and with the completion of our new plant, we will be in a position to carry up to 20,000 tons of clay in a condition ready to ship at any time, and with the irregularity of the demand among paper mills, the variation of their requirements in paper, some of which load very heavily with clay at times and at other times lighter, it is a great comfort to know that no matter what the demands may be, or how sudden, they can be taken care of immediately.

Besides all this, among all the Southern producers, the mines are run on non-union labor and never yet, as far as we can

recall, has a strike developed. The negro is strongly individualistic and does not lend himself to being organized.

Quantity

It is a natural question to ask as to whether the American mines are liable to be exhausted at a reasonably early period should the paper manufacturers switch from an English source of clay to a domestic product. We are willing to grant that the English mines are, in their entirety, almost inexhaustible. However, we can state conservatively that we have reserve supply, working our plants in an even larger way than we are doing today, to cover all requirements for many years to come.

As a final conclusion, we would like to recall the fact that we could have accomplished the results we, and our leading competitors among washingplants in the South, have in the way of a very perfectly mechanically washed clay for filler use only because we have been loyally supported by the paper mill manufacturers of the United States.

Is it not logical to believe that if we get the same support for this high grade filler and coating clay, that we can thereby become a stabilizing influence on prices, act as a regular source of supply, as well as an emergency source of supply? There are those among you who know that we are willing to extend our facilities to whatever extent the demand requires. We neither make the claim nor do we believe we have reachd the Nth degree in the development of our processes, but we do want your loyal support in our endeavors to that end.

At this point, we wish to acknowledge our debt to one of the great paper mills of the Middle West who stood with us in our early experiments in the development of our coating clay processes, and who, in consequence, made it possible to find out wherein our product was wrong and helped us to bring the clay up to its present standard.

Practically all users of clay know that the American product does not act the same as does the English, and in attempting to use this clay for coating work, difficulties will have to be overcome. This is easily accomplished by more violent agitation and possibly by deflocculating the clay to a moderate extent by the use of sodium silicate. We believe that the study and effort involved will be justified by the savings obtained, as well as by the benefit of prompt service and the satisfaction of giving business to an American producer and having the money stay in this country.

Samples of paper coated with this clay are herewith submitted, together with paper which has used this clay for replacing English clay as a high grade filler. We have also on the table, first, a sample of clay in its crude state, second, the same clay as a filler clay mechanically washed, and third, the same clay as produced for coating work by our latest process.

I would like to acknowledge with thanks the help received from the several chemists in paper mills for their assistance of whatever nature, together with the samples of paper containing our clay so kindly furnished.

C. W. Boyce Awarded Yale Fellowship

Charles W. Boyce, of the United States Forest Service, has been awarded a fellowship for study at Yale University. The paper industry knows Mr. Boyce as co-author of the Government's Bulletin on "How the United States Can Meet Its Present and Future Pulpwood Requirements."

Mr. Boyce, in his official capacity as Examiner in charge of the Forest Service work in forest economics, including the pulp and paper and lumber industries, has co-operated very closely with the Woodlands Section of the American Paper and Pulp Association and also with the Technical Association of the Pulp and Paper Industry.

Mr. Boyce is a graduate of the Forest School of the University of Michigan and has recently received a Master's degree from American University in Geography and Economics.

Foreign Research Students at Madison

MADISON, Wis., May 27, 1927.—There has assembled at the United States Forest Products Laboratory within recent months the largest group of foreign research men ever gathered at the federal laboratory at one time. Foresters and chemists from England, Australia, Sweden, Finland, and Mexico have been detailed to the laboratory by their various governments and employers for periods ranging from thirty days to two years.

Wilhelm Rosen, a graduate of the Technological Institute of Stockholm, Sweden, and fellow of the Scandinavian-American Foundation, has just finished nine months of research on the distillation of soft woods in the Forest Products Laboratory's chemical utilization section.

Eric Ostlin, also a fellow of the Scandinavian-American Foundation, will conclude observations of Forest Products Laboratory methods within a few weeks. In his native country, Mr. Ostlin, who is an expert on forest mensuration, has been directing a general forest survey which the Swedish government started ten years ago.

J. E. Cummins and H. S. Dadswell are on detail from the Australian Council for Scientific and Industrial Research to engage in general forest products research at the Madison laboratory for a period of two years.

W. G. Campbell, who is a fellow of the Commonwealth (British) Foundation has concluded a two years' stay at the laboratory. During his sojourn Mr. Campbell has been engaged in research on the fundamental chemistry of wood. He expects to accept an appointment with the Forest Products Research Laboratories of England on his return to that country.

Sr. Hermenegildo Barrios, a member of the first class to graduate from Mexico's new forestry school, has spent a year in studying the methods of various Forest Products Laboratory sections.

Uno W. Lehtinen, of the Finnish State Forestry Service, has just concluded a month of study at the Forest Products Laboratory. Mr. Lehtinen, who is a graduate of the Yale Forest School, has spent three years in this country and is to return to Finland soon. He is expected to take an important position in the forest products research laboratory which his government is to organize.

Weighing By Radio

A striking example of the practical adaptation of a new and highly theoretical science to the needs of an unrelated industrial art is found in a new type of weighing equipment recently placed on the market. It is a device developed by the research staff of the Eastern Manufacturing Company, large producers of pulp and paper.

The equipment, together with its auxiliaries, provides a means for weighing, recording, and controlling the unit weight of materials which are delivered from a machine in a continuous web, such as paper, rubber, or coated fabrics.

The principles underlying this unusual development are those of the tuned radio circuit, which is essentially duplicated in this equipment. The web of material passes between two parallel metal plates which act as a condenser in the receiving circuit. Variations in the weight of the web change the capacity of the condenser and affect the response of the circuit to a wave of controlled frequency. These variations are shown on a meter connected in the circuit and may be used to operate machine controls by suitable relays.

The accuracy of the weighing may be controlled to any degree desired, although with greater sensitiveness the range of the instrument is correspondingly restricted. The equipment is rugged in construction, and while exceedingly sensitive in its action, it is so built as to be unaffected by stray electrical influences, vibrations, or other plant conditions.—From Industrial Bulletin of Arthur D. Little, Inc.

HG&CO.

H. G. CRAIG & CO.
INCORPORATED

Paper Merchants
(Since 1868)

News
Hanging
Specialties
Mill Supplies

17 East 45th St. NEW YORK, N. Y.

Prompt deliveries made from stocks in
NEW YORK
BOSTON
PHILADELPHIA
CHICAGO

TRADE MARK

The users of Heller & Merz Colors have found that they can rely upon the quality of these dyestuffs. This faith of our customers in our ability and willingness to satisfy every requirement is important to manufacturers who demand excellence in dyestuffs and service.

The HELLER & MERZ COMPANY
505 Hudson St., New York

Boston 287 Atlantic Ave. | Chicago 146 W. Kinzie St. | Philadelphia 114 Market St.

Springfield, Mass. 24 Lester Street

Factory—NEWARK, N. J.

REG. U. S. PAT. OFF.

Three reasons
Why you should use

GATOR HIDE
SOUTHERN KRAFT

1. **Remarkable toughness**
2. **Smooth attractive finish**
3. **Uniform quality**

Gator Hide Paper is smooth in finish and an attractive light-brown in color. The Gator Hide trademark is your guarantee of the highest quality and absolute uniformity. For samples and complete information write to

INTERNATIONAL PAPER CO.
Executive and Main Sales Office: 100 East 42nd Street, NEW YORK CITY

Sales Offices
Boston Chicago Atlanta Pittsburgh Philadelphia

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Morris, Ill.—The Morris Paper Mill Company has completed plans for a new one-story addition on Washington street, to be used largely for storage and distributing service, and will proceed with erection at an early date. A general contract has been let to Hansen & Petersen, Joliet, Ill. The extension will cost about $55,000. C. A. Chapman, 9 South Clinton street, Chicago, Ill., is architect and engineer. W. H. Beckwith is president and general manager.

Raubsville, Pa.—The Northampton Paper Mills Company will replace the damage recently caused by fire at its local warehouse and distributing building. An official estimate of loss has not been announced, but is said to have been slight. G. H. Wright is superintendent.

Philadelphia, Pa.—The Crescent Box Company, D street and Erie Avenue, manufacturer of paper boxes and containers, has concluded negotiations for the purchase of property on Erie Avenue near F street, totaling about 50,000 sq. ft. of land, as site for a proposed new plant unit, for which plans are being completed by the Ballinger Company, Twelfth and Chestnut streets, architect and engineer. It will be two-story and basement, 80 x 300 ft., reported to cost approximately $100,000, with machinery. It is planned to proceed with the project at an early date.

Chicago, Ill.—The National Paper Napkin Company, 123 South Jefferson street, manufacturer of paper goods, has concluded a lease of a floor in the building at 1011-25 South California Avenue, for a term of years. The space aggregates 7000 sq. ft., and will be used for expansion in production.

Chattanooga, Tenn.—The Tennessee Paper Mills, North Chattanooga, are said to be planning the construction of a new mill unit to be devoted to the manufacture of shingles, formed of paperized material under a special process. The initial plant is reported to cost about $80,000, including equipment. A. M. Shepherd, vice-president, is in charge.

Chicago, Ill.—The American Carton Corporation, 1327 West Washington street, manufacturer of folding paper boxes and containers, has work in progress on a new plant in the Kenwood manufacturing district, West Fortieth street, vicinity of California street, and proposes to have the unit ready for service at an early date. It will be one-story, totaling about 44,000 sq. ft. of floor area; the site approximates 68,500 sq. ft., providing land for later expansion. The company, it is understood, purposes to remove the present plant to the new location, with installation of considerable additional equipment for enlarged output. The Egg Safety Carton Company, 4864 South Halsted street, manufacturer of special paper containers, will occupy a portion of the new plant of the American Carton organization, having leased about 12,800 sq. ft. of floor space. The present factory will be transferred to the new location and additional equipment and facilities arranged for advance in output. The two projects are reported to cost in excess of $100,000, with machinery.

Neenah, Wis.—The Kimberly-Clark Company, Neenah, is said to have consummated arrangements for immediate construction of its proposed new hydroelectric generating plant at Smoky Falls, Ont., to be used for its paper and pulp mills at that point. Surveys and plans have been in preparation for several months past. The entire project will represent an investment in excess of $2,500,000, with machinery and transmission system. The building contract has been let to Morrow & Beatty, Peterborough, Ont. George F. Hardy, 309 Broadway, New York, is engineer. Frank J. Sensbrenner is president and general manager.

Schodack, N. Y.—Ingalls & Company, Inc., recently chartered under state laws with a capital of 1200 shares of stock, no par value, is reported to be planning the operation of a local mill for the manufacture of paper goods. The company is headed by E. H. and M. P. Ingalls, and H. Roy Leonard, Castleton-on-Hudson, N. Y., and is represented by Whalen, Murphy, McNamee & Crable, 126 State street, Albany, N. Y., attorneys.

East Point, Ga.—Following its recent purchase of land at Marrero, New Orleans, La., as a site for a new plant, the Western Paper Makers Chemical Company, Kalamazoo, Mich., has organized a subsidiary, to be known as the Georgia-Louisiana Chemical Company, with headquarters at Atlanta, Ga., to carry out the New Orleans project, as well as the erection of another plant at East Point, where a tract of land has recently been secured. Plans for the last noted works will be arranged at an early date. The estimated cost has not been announced. It will be equipped for the production of alum from bauxite, and chemical specialties used in paper mill operations.

Montreal, Que.—The International Paper Company, New York, is reported to be planning an expansion and improvement program in the power properties of the Montreal-Ottawa Power Company, in which a controlling interest recently was secured, including transmission line construction.

Fort William, Ont.—The Great Lakes Paper Company, Ltd., Fort William, is perfecting plans for the erection of its proposed local paper mill for the manufacture of news print, and purposes to begin erection early in June. The plant will be equipped for an initial capacity of 200 tons per day, and is reported to cost in excess of $1,500,000, with machinery. The company purposes to construct additional units at a later date.

Stockholm, Sweden.—The Marma & Langrors Aktiebolag, Stockholm, is said to have authorized plans for the production of a new sulphate pulp mill at its Marma works, and will proceed with the project at an early date, with intention of having the unit ready for service in about 18 months. It will be equipped for an initial annual output of 40,000 tons. The estimated cost has not been announced.

New York, N. Y.—The Paper Bag Corporation has been incorporated with a capital of $100,000 and 500 shares of common stock, no par value, to manufacture paper bags and boxes, etc. The incorporators are Roswell S. Nichols, 66 Elm street, Westfield, N. J.; Leonard Belford and Solomon Traub, 1334 Intervale Avenue, Bronx, New York. The company is represented by Nichols & Snevily, 117 Liberty street, New York.

A History of Paper Manufacturing in the United States

By

LYMAN HORACE WEEKS

Author of "An Historical Digest of the Provincial Press," "Legal and Judicial History of New York',' "Prominent Families of New York," "Book of Bruce," etc., etc.

A comprehensive story of the paper making industry in this country from its small beginnings in 1690. All the material facts gathered into one complete, compact narrative. Illustrated.

$3.00 net—
Order from the publishers

LOCKWOOD TRADE JOURNAL CO.

10 East 39th St.

NEW YORK CITY

LINDSAY FOURDRINIER WIRES

are *Durable* and *Dependable*

Made in various meshes from No. 50 to No. 100. Also *Brass* and *Phosphor Bronze Cylinder Wires* in all meshes used in the Manufacture of Paper.

The Lindsay Wire Weaving Co.

Collinwood Sta. CLEVELAND, OHIO

West Virginia Pulp and Paper Company

Manufacturers of

SUPERCALENDERED
and
MACHINE FINISHED BOOK
and LITHOGRAPHIC
PAPERS

Offset, Envelope, Bond, Writing, Cover and Music Paper, High Grade Coated Book, Index Bristol, Post Card, Kraft and Label Papers.

also

Bleached Spruce Sulphite and Soda, Kraft Pulp

200 Fifth Avenue, New York — 732 Sherman Street, Chicago
503 Market St., San Francisco, Cal.
122 East 7th St., Los Angeles, Cal.
Sixth and Chestnut Sts., Philadelphia, Pa.

Imports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING MAY 28, 1927

SUMMARY

Cigarette paper .....28 cs.
Wall paper .....63 bls., 4 cs.
Paper hangings .....43 bls., 6 cs.
News print .....226 bls., 1,425 rolls
Printing paper .....149 bls., 96 rolls, 465 cs.
Wrapping paper .....50 bls., 49 rolls, 72 cs.
Packing paper .....8 rolls
Kraft paper .....206 bls.
Cover paper .....3 cs.
Drawing paper .....17 cs.
Decalcomania paper .....41 cs.
Tissue paper .....33 cs.
Gummed paper .....5 cs.
Stencil paper .....16 cs.
Surface coated paper.....70 cs.
Metal paper .....44 cs.
Writing paper .....9 cs.
Letter paper .....3 cs.
Photo paper .....1 cs.
Straw pulp board .....74 bls.
Straw board .....1,782 rolls
Miscellaneous paper..146 bls., 14 pkgs., 98 rolls, 125 cs.

CIGARETTE PAPER

Jovian Products Trading Co., Roussillon, Bordeaux, 8 cs.

Liggett & Myers Tobacco Co., La Savoie, Havre, 20 cs.

WALL PAPER

F. J. Emmerich, Minnekahda, London, 6 bls., 4 cs.

F. J. Emmerich, New York, Hamburg, 21 bls.

Brasch & Rothenstein, New York, Hamburg, 19 bls.

J. E. Bernard & Co., Belgenland, Antwerp, 17 bls.

PAPER HANGINGS

A. C. Dodman, Jr., Inc., Carinthia, Liverpool, 6 bls.

W. H. S. Lloyd & Co., Carmania, Liverpool, 22 bls., 6 cs.

Whiting & Patterson Co., Inc., Olympic, Southampton, 13 cs.

R. F. Downing & Co., La Savoie, Havre, 2 cs.

NEWS PRINT

The Times Co., Drottningholm, Gothenburg, 78 rolls.

Hudson Trading Co., Stureholm, Sundsvall, 138 rolls.

H. Reeve Angel & Co., Inc., Korsholm, Kotka, 196 bls.

Walker, Goulard, Plehn Co., Inc., Korsholm, Kotka, 56 rolls.

Parsons & Whittemore, Inc., Korsholm, Raumo, 30 bls.

Parsons & Whittemore, Inc., Republic, Bremen, 330 rolls.

M. Gottesman & Co., Inc., Aspen, Stockholm, 170 rolls.

A. S. Zabriskie, Pres. Roosevelt, Bremen, 169 rolls.

Parsons & Whittemore, Inc., Pres. Roosevelt, Bremen, 484 rolls.

PRINTING PAPER

Perkins, Goodwin & Co., New York, Hamburg, 155 cs.

Perkins, Goodwin & Co., New York, Hamburg, 149 bls.

P. C. Zuhlke, Belgenland, Antwerp, 21 rolls.

Watch Tower Bible & Tract Society, Korsholm, Kotka, 75 rolls.

E. Dietzgen & Co., Burgerdyk, Rotterdam, 43 cs.

C. Steiner, Burgerdyk, Rotterdam, 21 cs.

Miller, Wright Paper Co., Rotterdam, Rotterdam, 2 cs.

H. Reeve Angel & Co., Inc., Pres. Roosevelt, Bremen, 154 cs.

Walker, Goulard, Plehn Co., Inc., Pres. Roosevelt, Bremen, 61 cs.

E. Dietzgen & Co., Rotterdam, Rotterdam, 29 cs.

WRAPPING PAPER

J. P. Heffernan Paper Co., Saugus, Genoa, 50 bls.

D. S. Walton & Co., Drottningholm, Gothenburg, 44 rolls.

F. C. Strype, Belgenland, Antwerp, 27 cs., 5 rolls.

H. Reeve Angel & Co., Inc., Belgenland, Antwerp, 4 cs.

Birn & Wachenheim, Belgenland, Antwerp, 41 cs.

PACKING PAPER

A. B. Scott, Rotterdam, Rotterdam, 8 rolls, casks.

KRAFT PAPER

F. C. Strype, Thuringia, Hamburg, 206 bls.

COVER PAPER

International Forwarding Co., New York, Hamburg, 3 cs.

DRAWING PAPER

Keuffel & Esser Co., New York, Hamburg, 16 cs.

Keuffel & Esser Co., Carmania, Liverpool, 1 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Baltic, Liverpool, 33 cs.
C. W. Sellers, New York, Hamburg, 3 cs.
C. W. Sellers, Pres. Roosevelt, Bremen, 5 cs.

TISSUE PAPER

B. F. Drakenfeld & Co., Baltic, Liverpool, 9 cs.
F. B. Vandegrift & Co., Carinthia, Liverpool, 24 cs.

GUMMED PAPER

Meadows, Wye & Co., Minnekahda, London, 5 cs.

STENCIL PAPER

Arlac Dry Stencil Co., New York, Hamburg, 16 cs.

SURFACE COATED PAPER

Whiting & Patterson Co., Inc., New York, Hamburg, 12 cs.

P. C. Zuhlke, Belgenland, Antwerp, 42 cs.

Gevaert Co. of America, Belgenland, Antwerp, 16 cs.

METAL PAPER

Hensel, Bruckman & Lorbacher, Stuttgart, Bremen, 33 cs.

Baldwin Universal Co., Stuttgart, Bremen, 1 cs.

WRITING PAPER

Guibout freres, Olympic, Southampton, 5 cs.

Japan Paper Co., La Savoie, Havre, 4 cs.

LETTER PAPER

Buffums Dry Goods Co., La Savoie, Havre, 3 cs.

PHOTO PAPER

J. H. Schroeder Banking Corp., Stuttgart, Bremen, 1 cs.

STRAW PULP BOARD

J. P. Heffernan Paper Co., Burgerdyk, Rotterdam, 74 bls.

STRAW BOARD

Perkins, Goodwin & Co., Burgerdyk, Rotterdam, 87 rolls.

R. Wilson Paper Corp., Burgerdyk, Rotterdam, 166 rolls.

Grand Corrugated Paper Co., Burgerdyk, Rotterdam, 180 rolls.

A. Vuyk, Burgerdyk, Rotterdam, 497 rolls.

A. Vuyk, Rotterdam, Rotterdam, 280 rolls.

Haas Bros., Rotterdam, Rotterdam, 252 rolls.

Perkins, Goodwin & Co., Rotterdam, Rotterdam, 153 rolls.

J. P. Heffernan Paper Co., Rotterdam, Rotterdam, 167 rolls.

MISCELLANEOUS PAPER

O. Hommel & Co., Baltic, Liverpool, 6 cs.

Gilbert Paper Co., Drottningholm, Gothenburg, 95 bls., 20 rolls.

The Borregaard Co., Inc., Drottningholm, Gothenburg, 78 rolls.

Wilkinson Bros. & Co., Inc., Drottningholm, Gothenburg, 29 cs.

E. H. Sergeant & Co., Drottningholm, Gothenburg, 2 cs.

Perkins, Goodwin & Co., New York, Hamburg, 31 bls.

S. Gilbert, Burgerdyk, Rotterdam, 9 cs.

T. Beckhardt & Co., Burgerdyk, Rotterdam, 4 cs.

Wilkinson Bros. & Co., Inc., Thuringia, Hamburg, 2 cs.

H. Reeve Angel & Co., Inc., Olympic, Southampton, 20 bls.

C. Grimmer & Son, La Savoie, Havre, 1 cs.

American Express Co., La Savoie, Havre, 1 cs.

Hudson Forwarding Co., La Savoie, Havre, 1 cs.

Canson & Montgolfier, La Savoie, Havre, 39 cs.

R. F. Downing & Co., La Savoie, Havre, 2 cs.

P. H. Petry & Co., La Savoie, Havre, 8 pkgs.

E. Dietzgen & Co., La Savoie, Havre, 1 cs.

Hensel, Bruckman & Lorbacher, La Savoie, Havre, 8 cs.

F. J. Emmerich & Co., La Savoie, Havre, 6 pkgs.

Bertrand, La Savoie, Havre, 4 cs.

Hammacher & Schlemmer Co., La Savoie, Havre, 3 cs.

E. Dietzgen & Co., Rotterdam, Rotterdam, 6 cs.

International Forwarding Co., Rotterdam, Rotterdam, 7 cs.

RAGS, BAGGINGS, ETC.

American Exchange Irving Trust Co., Laura C., Trieste, 31 bls. rags.

Bulkley, Dunton & Co., Laura C., ——, 135 bls. rags.

Darmstadt, Scott & Courtney, Laura C., Trieste, 5 bls. rags.

New York Trust Co., Kyno, Antwerp, 15 bls. rags.

Brown Bros. & Co., Kyno, Hull, 279 bls. rags.

Darmstadt, Scott & Courtney, Kyno, Hull, 24 bls. rags.

Amtorg Trading Corp., New York, Hamburg, 218 bls. rags.

A. H. Searle, American Banker, London, 21 bls. rags.

Hanover National Bank, American Banker, London, 50 bls. rags.

Bulkley, Dunton & Co., Stuttgart, ——, 41 bls. rags.

Chemical National Bank, Burgerdyk, Rotterdam, 22 bls. rags.

Bulkley, Dunton & Co., Burgerdyk, ——, 344 bls. bagging.

A. W. Fenton, Inc., Republic, Bremen, 35 bls. rags.

American Over Ocean Corp., May. Maru, Kobe, 100 bls. rags.

Brown Bros. & Co., Exeter City, Bristol, 35 bls. bagging.

Darmstadt, Scott & Courtney, Com'l Trader, Buenos Aires, 38 bls. rags.

Chemical National Bank, Oklahoma, Havre, 52 bls. new cuttings.

Chase National Bank, Oklahoma, Havre, 41 bls. rags.

American Exchange Irving Trust Co., Oklahoma, Havre, 37 bls. rags.

French American Banking Corp., Oklahoma, Havre, 114 bls. rags.

W. Schall & Co., Oklahoma, Havre, 109 bls. rags.

Brown Bros. & Co., City of Pretoria, Newcastle, 394 bls. rags.

OLD ROPE

Penn Rag & Metal Co., Kyno, Hull, 61 coils.

Brown Bros. & Co., Belgenland, Antwerp, 60 bls.

Brown Bros. & Co., Burgerdyk, Rotterdam, 132 pkgs.

Brown Bros. & Co., Exeter City, Bristol, 168 coils.

Montell & McDonough, Munorleans, Nassau, 2 bls.

E. Butterworth & Co., Inc., City of Pretoria, Hull, 47 coils.

Brown Bros. & Co., City of Pretoria, Newcastle, 75 coils.

New York Trust Co., City of Pretoria, Newcastle, 77 coils.

Brown Bros. & Co., Rotterdam, Rotterdam, 37 coils, 30 bls.

MANILA ROPE

Ellermans' Wilson Line, Minnekahda, London, 70 coils.

WOOD PULP

J. Anderson & Co., Drottningholm, Gothenburg, 250 bls. wood pulp.

Price & Pierce, Ltd., Drottningholm, Gothenburg, 625 bls. wood pulp.

Scandinavian Pulp Agency, Inc., Stureholm, Skutskar, 3,500 bls. dry pulp.

Scandinavian Pulp Agency, Inc., Stureholm, Sundsvall, 1,250 bls. sulphate.

Scandinavian Pulp Agency, Inc., Stureholm, Sundsvall, 1,005 bls. sulphite.

Johanson, Wales & Sparre, Inc., Stureholm, Sundsvall, 2,250 bls. sulphite.

M. Gottesman & Co., Inc., Stureholm, Sundsvall, 2,000 bls. sulphite.

Bulkley, Dunton & Co., Stureholm, ——, 1,300 bls. wood pulp.

Castle & Overton, Inc., Bellepline, Rotterdam, 580 bls. wood pulp, 94 tons.

Castle & Overton, Inc., Stuttgart, Bremen, 915 bls. wood pulp.

Bulkley, Dunton & Co., Stuttgart, ——, 125 bls. wood pulp.

Johanson, Wales & Sparre, Inc., Thuringia, Hamburg, 150 bls. sulphite, 25 tons.

Buck, Kiaer & Co., Inc., Aspen, Stockholm, 1,200 bls. sulphite.

M. Gottesman & Co., Inc., Rotterdam, Rotterdam, 670 bls. wood pulp.

WOOD PULP BOARDS

Lagerloef Trading Co., Republic, Bremen, 205 bls., 29 tons.

WOOD FLOUR

State Chemical Co., Bellepline, Rotterdam, 638 bags, 34,020 kilos.

E. M. Sergeant & Co., Aspen, Stockholm, 949 bags.

CASEIN

T. M. Duche & Sons, Roussillon, Bordeaux, 20 bags.

Crawford, Hammond & Co., Com'l Trader, B. Aires, 843 bags, 50,580 kilos.

CHINA CLAY

J. Lee Smith Co., Exeter City, Bristol, 300 bags.
C. T. Wilson & Co., Exeter City, Bristol, 25

E. J. KELLER COMPANY
INCORPORATED
200 FIFTH AVENUE
NEW YORK

FOREIGN AND DOMESTIC
PAPER MAKERS' SUPPLIES
COTTON, JUTE AND FLAX WASTES
WOOD PULP AND RAG PULP

SOLE AGENTS IN AMERICA FOR
ETTLINGEN MITSCHERLICH UNBLEACHED SULPHITE
ROSENBERGER BLEACHED SULPHITE
ZILINA BLEACHED SULPHITE
STAFFEL RAG PULP
BLEACHED AND UNBLEACHED

Import Credits

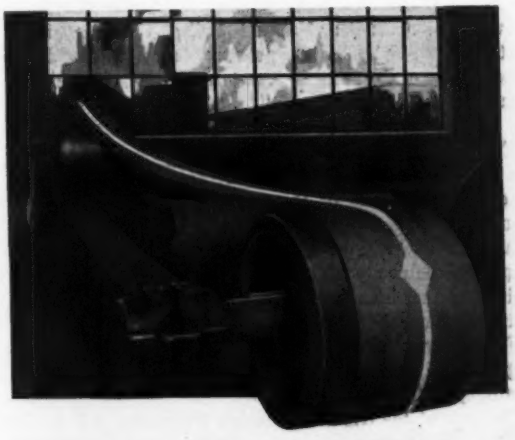
Complete facilities for opening letters of credit in Scandinavia to finance importations of wood-pulp and paper.

INTERNATIONAL
ACCEPTANCE BANK, INC.

52 Cedar Street, New York

PAUL M. WARBURG
Chairman

P. ABBOT GOODHUE
President



You will find Pacemaker belting worthy of the name. Wherever heavy, hard, fast drives are common, you can depend on Pacemaker hanging closer to the pulley, running truer, transmitting more horsepower, lasting longer and standing more abuse. Pacemaker will more than earn its cost in your service.

Pacemaker *in* **Name & Performance**

If you are interested in transmission or conveyor belting, paper mill hose, screen diaphragms, water marker bands, etc., let us send you our catalog—it may help solve your problems.

The Cincinnati Rubber Mfg. Co.
Cincinnati - Ohio

Imports of Paper and Paper Stock

(*Continued from page 98*)

PHILADELPHIA IMPORTS

WEEK ENDING MAY 28, 1927

Congoleum Nairn Co., Laura C., Naples, 317 bls. rags.
Brown Bros. & Co., Laura C., Venice, 39 bls. rags.
E. M. Sergeant & Co., Korsholm, Gothenburg, 1,495 bls. dry soda pulp.
Price & Pierce, Ltd., Korsholm, Gothenburg, 1,590 bls. wood pulp.
Price & Pierce, Ltd., Korsholm, Gothenburg, 3,021 rolls wood pulp.
Castle & Overton, Inc., Bellepline, Rotterdam, 923 bls. wood pulp, 153 tons.
Paper Service Co., Bellepline, Rotterdam, 4 cs. paper.
S. Spector & Co., Bellepline, Rotterdam, 58 bls. rags.
F. W. Winne & Sons, Bellepline, Rotterdam, 200 pkgs. rope.
American Express Co., Exeter City, Bristol, 95 bls. rags.
Old Colony Trust Co., Exeter City, Bristol, 86 coils old rope.
T. M. Duche & Sons, Com'l Trader, Buenos Aires, 417 bags casein, 25,020 kilos.
Johnston Paper Co., Korsholm, Kotka, 126 bls. news print.
Castle & Overton, Inc., Oklahoma, Havre, 167 bls. rags.
A. Hurst & Co., Oklahoma, Havre, 258 bls. rags.
Buck, Kiaer & Co., Malmen, Oslo, 200 bls. sulphite pulp.

BOSTON IMPORTS

WEEK ENDING MAY 28, 1927

Brown Bros. & Co., Kyno, Hull, 111 bls., 471 coils old rope.
E. Butterworth & Co., Inc., Kyno, Antwerp, 27 bls. rags.
The Borregaard Co., Inc., Stureholm, Hurum, 1,200 bls. sulphate pulp.
Pagel, Horton & Co., Inc., Stureholm, Skutskar, 4,000 bls. wood pulp.
Scandinavian Pulp Agency, Inc., Stureholm, Skutskar, 600 bls. wood pulp.
Scandinavian Pulp Agency, Inc., Stureholm, Sundsvall, 1,500 bls. sulphite pulp.
Bulkley, Dunton & Co., Stureholm, ——, 3,375 bls. wood pulp.
J. Anderson & Co., Aspen, Greaker, 1,104 bls. sulphite.
The Borregaard Co., Inc., Aspen, Greaker, 180 bls. sulphite.
Bank of N. Y. & Trust Co., Aspen, Frederickhald, 3,000 bls. sulphite.
J. Anderson & Co., Aspen, Gothenburg, 3,750 bls. sulphite.
The Borregaard Co., Inc., Aspen, Gothenburg, 1,750 bls. wood pulp.
Parsons & Whittemore, Inc., Aspen, Gothenburg, 180 bls. sulphite.
Johanson, Wales & Sparre, Inc., Aspen, Gothenburg, 50 bls. sulphite.
M. Gottesman & Co., Inc., Aspen, Gothenburg, 81 rolls news print.

NORFOLK IMPORTS

WEEK ENDING MAY 28, 1927

J. Anderson & Co., Aspen, Greaker, 1,716 bls. sulphite.
The Borregaard Co., Inc., Aspen, Gothenburg, 1,000 bls. wood pulp.
E. M. Sergeant & Co., Aspen, Gothenburg, 400 bls. sulphite.
Ossian Ray, Aspen, Gothenburg, 84 rolls news print.

BALTIMORE IMPORTS

WEEK ENDING MAY 28, 1927

National City Bank, Saugus, Marseilles, 183 bls. rags.
National City Bank, Oklahoma, Havre, 1,177 bls. rags.
National City Bank, Oklahoma, Dunkirk, 76 bls. bagging.
National City Bank, Oklahoma, Dunkirk, 282 bls. rags.
Bulkley, Dunton & Co., Lorain, ——, 106 bls. rags.

Raymond, Wash., Possible Pulp Mill Location

[FROM OUR REGULAR CORRESPONDENT]

PORTLAND, Ore., May 26, 1927.—Three capitalists of Portland, Ore., are concentrating their interests on the old Hanify mill site in Raymond, Wash., as a location for a pulp mill. While these men are at present on the ground and are asking that a water supply be assured, they do not consent as yet to the publication of their names officially.

It is understood that this company when organized would take over the Trap Creek Logging Company's plant to provide the lumber for the pulp manufacture, this mill to be confined principally to the cutting of hemlock and spruce. The Hanify lumber plant has a capacity of 100,000 feet per day.

The initial investment of the proposed pulp mill in connection with the lumber company would involve more than $1,000,000 and would employ 185 men, according to report made by the investors to the city council of Raymond.

J. E. Buckingham, city engineer, states that fourteen million gallons of water can be furnished daily from the rights that the city now holds and the capitalists who are to build the mill ask only 6 million gallons as a guarantee. This will cover the needs not only of the proposed pulp mill to be built immediately, but also of a paper mill unit to be added later.

If plans go through without delay the new pulp plant may be in operation within six months.

Dickinson Attends Foreign Trade Congress

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., May 25, 1927.—B. C. Dickinson, president of the Standard Paper Company, went to Detroit Wednesday to attend the National Foreign Trade Congress, in session there today, Thursday and Friday. He was named a delegate by Gov. Fred W. Green. This gathering is bringing together prominent manufacturers and financiers from many countries. The meetings will consider foreign trade from many angles, particularly aiming to give information that will expand American exports.

Plans For Canadian Technical Meeting

The Canadian Technical Section has arranged an extremely interesting and enjoyable trip for its summer meeting June 22 to 24.

The trip will start at Quebec City where the members and visitors will meet on Monday, June 22. A special train has been provided by Canadian National Railways which will take the party to Lake St. John, the pullmans being switched in to Riverbend where a day will be spent inspecting Price Brothers and Company, Ltd., new paper mill and Duke-Price power plant on the Grande Decharge of the Saguenay at Ile Maligne.

The pullmans will then be moved to Kenogami for a day where the mill of Price Brothers which has a Minton Vacuum Dryer in operation on one of the paper machine there, also the new plant of Aluminum Company may be seen.

Another day will be spent at Port Alfred on Ha! Ha! Bay inspecting the new plant of Port Alfred Pulp and Paper Company which has just been completed. There it will also be possible to visit the plant of Chicoutini Pulp Company which is close by.

From Port Alfred the party will take a steamer down the Saguenay River, one of the most famous scenic trips in Canada, returning to Quebec by daylight.

The cost of the trip from Quebec and return will be about $40.

A cordial invitation has been received from Edward Berk, secretary of the Canadian Technical Section for the members of the Technical Association to attend.

As arrangements must be made reservations on the train and boat should be made to Mr. Beck, Drummond Building, Montreal, promptly by all who plan to go.

L. Tyler Townsend Dead

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., June 1, 1927.—L. Tyler Townsend who has been associated with Knight, Allen & Clark since November, 1926, died suddenly Friday morning, May 27. Mr. Townsend was formerly associated with Lester P. Winchenbaugh.

Cotton and Paper Rolls
Super Calenders
Friction Calenders
Embossing Calenders
Hydraulic Presses and Pumps

Successors to the Granger Foundry & Machine Co.

The Textile-Finishing Machinery Company
PROVIDENCE, R. I.

TRADE MARK

B

Registered

DIAMOND B SPLICING TISSUE

HIGHEST QUALITY
SPECIALLY MADE FOR THE PAPER TRADE
PRICES ON APPLICATION

BEMIS ASSOCIATES INC.
WATERTOWN, MASS.

Strength to spare

Each genuine Jenkins Valve is made with strength to spare. Each, before it leaves the Jenkins factory, must pass a test which provides for a wide margin of safety.

Strength to spare is the reason a Jenkins gives *service* to spare—long term low cost service which puts an end to frequent repairs and replacements.

Strength to spare has been a part of the Jenkins manufacturing policy for over 60 years. It has been a factor in winning and holding the friendships of engineers by the hundred.

There are genuine Jenkins Valves for practically every requirement of the paper industry.

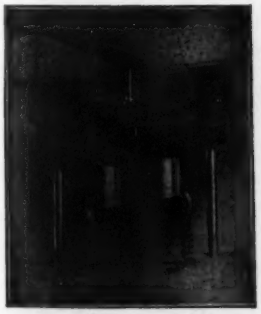
At supply houses everywhere.

Fig. 270

Screwed, Jenkins Medium Pressure Bronze Gate Valve.

JENKINS BROS.
80 White Street .....New York, N. Y.
524 Atlantic Avenue .....Boston, Mass.
133 No. Seventh Street...Philadelphia, Pa.
646 Washington Boulevard....Chicago, Ill.
JENKINS BROS., LIMITED
Montreal, Canada .....London, England

Always marked with the "Diamond"
Jenkins Valves
SINCE 1864



TYPE "B" IRON EXTRACTOR

It consists of special magnetic surfaces of great power over which the paper stuff is made to pass. As a result, all the iron and many other foreign substances are completely extracted. Hundreds of these devices are in use daily and no one of them has failed to give complete satisfaction. Write us for Bulletins and full details.

for **PAPER MAKING**

THE ROLAND T. OAKES CO., Holyoke, Mass.
Electrical Specialists. *Established 1885*

New York Market Review

Office of THE PAPER TRADE JOURNAL,
Wednesday, June 1, 1927.

Affected somewhat by the holiday spirit, trading in the local paper market quieted down considerably during the past week. However, judging by the volume of inquiries being received for the various grades of paper, an improvement may be expected shortly. Prices remain steady and so far it is difficult to detect any definite trend in the market.

Production of news print continues heavy and the output is being steadily absorbed, regular contracts accounting for the bulk of the business. The spot market is fairly active and offerings are reported to be ample for current requirements. Contract prices of news print are being maintained.

Demand for paper board is normal for the time of the year, and, with production keyed to consumption, prices remain steady to firm. The tone of the fine paper market is practically unchanged. Most of the business transacted lately has been along routine lines, at scheduled prices. The position of the coarse paper market is satisfactory and wrapping paper continues in good request. Prices are unaltered.

Mechanical Pulp

Although the amount of new business transacted lately in the ground wood market is reported to be light, contract shipments continue to move in satisfactory volume. Prices of both imported and domestic ground wood remain fairly steady. Accumulations are said to be sufficiently heavy to take care of current needs.

Chemical Pulp

A slight improvement has been noticed in the demand for both imported and domestic chemical pulp and, attracted by the easier prices which have prevailed recently, some fair sized orders have been booked from the paper and board mills, mostly for future delivery. Demand for the lower grades remains light but the higher grades are in much better request.

Old Rope and Bagging

Foreign and domestic old rope are in fair demand, particularly No. 1 domestic old manila and No. 1 imported old manila. Prices remain practically unchanged. The tissue mills are reported to be taking more interest in No. 1 scrap bagging but gunny bagging remains comparatively quiet.

Rags

Some little interest is developing in the imported rag market. Linsey garments are in improved demand. Prices remain fairly steady. The domestic rag market is in a sound position. New cotton cuttings are in better request, while there is a steady inquiry for practically all the various grades. Prices are holding up very well.

Waste Paper

Conditions in the paper stock market have not changed materially of late. The paper mills, however, are expected to show more interest in the market in the near future, as their stocks are reported to be low, and dealers are looking forward to a more lively period shortly. Demand for over-issue news and mixed paper is beginning to show signs of improvement.

Twine

The business transacted in the twine market during the past week was mostly along routine lines. Wrapping paper is still said to be in excellent request, and should this condition continue, the twine industry will undoubtedly benefit proportionally. Prices remain steady and the recent advances on cotton twine are being maintained.

Box Board Production for April

[FROM OUR REGULAR CORRESPONDENT]

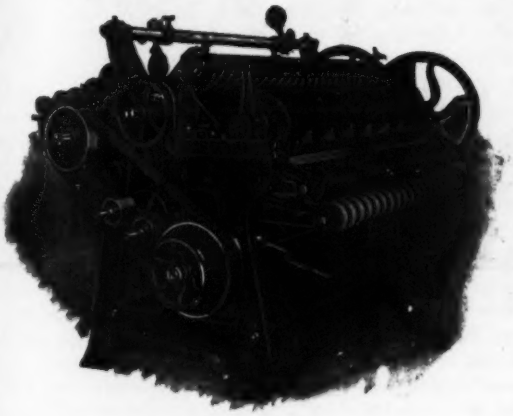
WASHINGTON, D. C., May 21, 1927.—April production of box board, based on reports to the Department of Commerce by 92 firms operating 119 plants, and in addition for earlier months for three concerns now out of business, was 80.4 per cent of capacity, as compared with 83.3 per cent in March and 83.2 per cent in April, 1926. In the following table the capacity data vary according to the normal number of working days in each month.

Year and Month	Operation: Inch hours Capacity	Operation: Inch hours Operated	Operation: Per cent of Capacity	Production: Short Tons Capacity	Production: Short Tons Output	Production: Per cent of Capacity	New Orders (Short Tons)	Unfilled Orders (end of month) (Short Tons)
1926								
January	10,081,400	8,134,718	80.7	241,377	197,360	81.8	211,263	120,091
February	9,597,504	7,975,249	83.1	230,568	196,965	85.4	183,030	106,269
March	10,797,192	9,161,681	84.9	259,389	225,688	87.0	219,994	104,128
April	10,397,296	8,628,895	83.0	249,782	207,765	83.2	194,824	90,671
Total (4 mos.)	40,873,392	33,900,543	82.9	981,116	827,778	84.4	809,111	.....
May	9,997,400	8,400,090	84.0	240,175	207,498	86.4	200,832	83,452
June	10,397,296	9,139,549	87.9	249,782	221,909	88.8	242,089	109,559
July	10,397,296	8,603,941	82.8	249,782	206,235	82.6	219,271	122,202
August	10,397,296	9,140,370	87.9	249,782	226,337	90.6	212,845	110,362
Sept.	9,997,400	9,311,937	93.1	240,703	230,050	95.6	219,850	102,027
Oct.	10,397,296	9,659,004	92.9	250,640	226,180	90.2	224,829	93,263
Nov.	10,027,378	8,527,390	85.0	241,195	217,850	90.3	187,295	69,118
Dec.	10,399,172	6,943,193	66.8	250,250	165,074	66.0	190,163	86,562
Total	122,883,926	103,626,017	84.3	2,953,425	2,528,911	85.6	2,506,285	.....
1927								
January	9,851,050	6,998,505	71.0	244,007	173,629	71.2	194,285	105,669
February	9,457,008	*7,583,477	*80.2	234,552	*189,273	80.7	*183,861	*102,005
March	10,639,134	*8,605,866	*80.9	263,871	*219,682	*83.3	*229,376	*113,583
April	10,245,092	7,701,936	75.2	254,098	204,396	80.4	196,528	101,361
Total (4 mos.)	40,192,284	30,889,784	76.9	996,528	786,980	79.0	804,050	.....

Year and Month	Shipments of boxboard (Short Tons)	Stocks of boxboard, end of month (Short Tons)	Consumption of waste paper: Capacity (Short Tons)	Consumption of waste paper: Consumed (Short Tons)	Per cent of Capacity	Stocks of waste paper, end of month: On hand (Short Tons)	Stocks of waste paper, end of month: In transit and unshipped purchases (Short Tons)
1926							
January	196,544	49,634	233,311	187,915	80.5	172,203	44,477
February	194,704	50,717	223,512	187,871	84.1	166,536	55,035
March	222,018	54,265	251,451	214,046	85.1	154,923	42,971
April	208,281	53,661	242,138	209,243	86.4	149,742	50,480
Total (4 mos.)	821,547	.....	960,412	799,077	83.2	.....	.....
May	207,934	54,599	232,825	193,892	83.3	140,718	45,327
June	215,931	60,080	242,138	213,912	88.3	139,967	58,820
July	206,591	59,193	242,256	201,582	83.2	145,334	60,482
August	224,702	60,420	242,538	222,403	91.7	195,597	57,285
September	227,824	62,669	233,325	212,608	91.1	120,087	70,311
October	233,593	55,650	242,658	216,871	89.4	142,830	59,076
November	211,005	62,058	233,455	201,633	86.4	151,187	46,175
December	172,815	55,159	241,418	159,969	66.3	166,153	34,662
Total	2,521,942	.....	2,861,025	2,421,947	84.7	.....	.....
1927							
January	175,528	53,562	232,942	163,337	70.1	163,023	38,062
February	*189,032	*53,327	224,160	*182,322	*81.3	*158,222	40,602
March	*217,973	*54,327	252,180	*209,388	83.0	154,742	43,789
April	208,750	49,973	242,840	188,829	77.8	147,758	46,314
Total (4 mos.)	791,283	.....	952,122	743,876	78.1	.....	.....

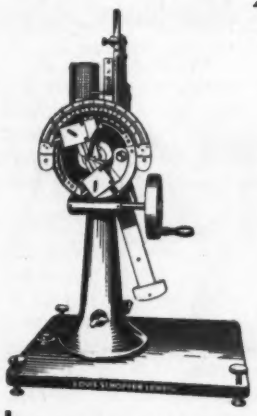
* Revised.

Paper Cutters
Single, Duplex and Diagonal



CUTTER KNIVES PATENT TOP SLITTER

HAMBLET MACHINE CO.
LAWRENCE MASS.



SCHOPPER
BENDING TESTER
FOR BOARDS

Gives Accurate Test for Bending Strength, Bending Angle for Leather Board, Wood Pulp Board, Straw Board, Etc.

For 45 years SCHOPPER Precision Instruments have been the World's Standard.

Sole Agents for United States and Canada

FOREIGN PAPER MILLS, INC.
72 DUANE ST. NEW YORK

SHIPPING INSURANCE
The Use of
ELIXMAN CORES
protects your rolls and insures their delivery to your customer in perfect condition. They eliminate claims for damages.

SHIPPING INSURANCE

Your two sources of supply are

Canadian Elixman Company
HAMILTON, ONTARIO

Elixman Paper Core Company
CORINTH, N. Y.

WOODPULP AGENTS

PRICE & PIERCE, Ltd.,

17 EAST 42ND ST.
NEW YORK

Miscellaneous Markets

Office of THE PAPER TRADE JOURNAL,
Wednesday, June 1, 1927.

Trading in the local chemical market during the past week was fairly satisfactory for the time of the year. Prices are being well maintained, in most instances, although some buyers are reported to be holding back with the expectation of securing more favorable terms in the near future. Shipments against contract continue to move in good volume.

BLANC FIXE.—Although business in the blanc fixe market is rather quiet at present, the market is in a sound condition and prices are holding up to schedule. The pulp is still quoted at $60 per ton, in bulk, while the powder is selling at from 4 cents to 4¼ cents per pound, in barrels, at works.

BLEACHING POWDER.—Steadiness prevails in the bleaching powder market. The demand for this product is well sustained and contract withdrawals continue to proceed at an excellent pace. Bleaching powder is offered at from $2 to $2.40 per 100 pounds, in large drums, at works, according to quantity.

CASEIN.—Demand for casein during the past week was mostly along routine lines. Stocks in hand are said to be about sufficient to take care of current requirements. Prices are practically unchanged. Imported casein is quoted at from 18 cents to 18¼ cents a pound. Domestic casein is selling at from 18¼ cents to 19 cents a pound, all in bags, car lot quantities.

CAUSTIC SODA.—There has been a slight slowing up in the demand for caustic soda but the market is considered to be in a sound position and prices are holding up to schedule. Caustic soda is still quoted at from $3 to $3.10 per 100 pounds, in large drums, at works. Spot car lots are offered at $3.20 per 100 pounds.

CHINA CLAY.—No radical changes were reported in the china clay market during the past week. Shipments against contract continue to move regularly. The demand for this product is normal and prices are unaltered. The quotation on imported china clay ranges from $15 to $25 a ton, in bulk, ship side. Domestic washed clay is quoted at from $8 to $9 a ton, at mine, and pulverized at $10 per ton.

CHLORINE.—Contract withdrawals of chlorine are moving in heavy volume and the market rules steady to firm. Prices continue to hold up to the schedule which has been maintained for some considerable time. Chlorine is quoted at 4 cents a pound, in tanks, or multi-unit cars, at works, on contract, while the spot price is from 4¼ cents to 4½ cents a pound.

ROSIN.—The rosin market was fairly steady during the past week. Prices, however, are still inclined to fluctuate. At the naval stores, the grades of gum rosin used in the paper mills are now offered at from $10.30 to $10.60 per 280 pounds, ex dock, in barrels. Wood rosin remains unchanged at $9.50 per 280 pounds, at southern shipping points.

SALT CAKE.—Conditions in the salt cake market are little changed. Shipments against contract continue to move at a steady rate. Prices are holding up to schedule, with little talk of concessions. Salt cake is quoted at from $18 to $19 a ton, in bulk, at works. Chrome salt cake is selling at from $14 to $15 a ton, in bulk, at works.

SODA ASH.—The tone of the soda ash market is steady and prices continue to hold up very well to the previously reported levels. Contract withdrawals are proceeding at a satisfactory pace, and the outlook for the future is promising. Contract quotations, in car lots, at works, are as follows: in bags, $1.32½, and in barrels, $1.57½.

STARCH.—Stocks of starch are said to be adequate for current requirements. Demand for this product continues normal for the season and shipments are going forward regularly. Special paper makers' starch is still quoted at $3.07 per 100 pounds, in bags, and at $3.24 per 100 pounds, in barrels.

SULPHATE OF ALUMINA.—While both commercial and iron free sulphate of alumina are moving in good volume on contract, the spot market is rather quiet. Prices remain unaltered. Commercial grades of sulphate of alumina are still quoted at from $1.40 to $1.50 per 100 pounds, in bags, at works, in car lots. The iron free is selling at from $2 to $2.05 per 100 pounds, in bags, at works.

SULPHUR.—Most of the business transacted in the sulphur market during the past week was along routine lines. The market is in a very sound position and prices remain unchanged at formerly quoted levels. Sulphur is still offered at from $18 to $19 a ton, in bulk, at mine, on contract orders. The spot quotation is $20 per ton.

TALC.—The talc market continues to follow the even tenor of its way, and conditions remain practically unchanged. The demand for this product is normal and shipments are moving into consumption in routine volume. Domestic talc is still selling at from $16 to $18 a ton, at mine. Imported talc is quoted at from $18 to $20 a ton, ship side.

Waste Paper Dealers Disagree

DENVER, Col., May 20, 1927.—Samuel Friedman of the Grimes & Friedman Company, collectors of waste paper, through his attorneys, filed suit in the Denver district court, May 16, charging fraud and conspiracy against his partner, Edward Grimes, and asks the dissolution of the partnership. It is recited that Grimes through the formation of the Semrig Corporation was fraudulently diverting the business built up by Grimes & Friedman to the Semrig concern. A specific instance was the securing of a contract by the Semrig Corporation to furnish the Colorado Pulp & Paper Company with old magazines; that the Grimes & Friedman Company had been negotiating for this same business previous to the formation of the Semrig Company.

Mr. Friedman relates that the business of Grimes & Friedman formed in 1912 had grown, chiefly through his efforts and was doing business running over $1,000,000 a year. Branch houses were established at Tulsa, Oklahoma; Salt Lake City, Utah, and Wichita, Kansas.

It is further charged that Grimes scattered propaganda against the firm of Grimes & Friedman and many employees and folks who sold paper to the firm became dissatisfied and quit them. He asks that a receiver be appointed for his own firm, the business be liquidated and that Mr. Grimes be forced to give him half of the assets and half the profits derived through the Semrig Corporation.

Mr. Grimes says that the formation of the Semrig concern was due to Mr. Friedman refusing to join him in a contract with the Colorado Pulp and Paper Company; that he offered Friedman an opportunity to buy a half interest.

Windstorm Does Damage in Miami Valley

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, May 23, 1927.—The Miami Valley was visited by a wind of cyclonic proportions and a torrential downpour Wednesday night and Thursday morning, considerable loss having been sustained by many interests, especially agricultural. However, the industries did not escape and there was some loss among the paper and allied concerns.

In Miamisburg, ten miles south of Dayton, trees were leveled as well as buildings. The heavy smokestack of the twine mills in that town was blown down and crashed through the roof of the power house, resulting in a heavy loss.

The repairs are under way and the accident will not interfere with the regular operation of the plant, it is believed.

On the Cincinnati North railroad, between St. Henry and Coldwater, Ohio, a washout the same night caused a wreck in which a number of cars of merchandise were destroyed, including one containing news print rolls consigned to a Cincinnati newspaper. The car was loaded solidly with the news print and all was a total loss.

AT LAST!!!

AN AMERICAN COATING CLAY

ASK FOR "H. T" BRAND

"H. T." Clay is also a Very High Grade Filling Clay
Over 42 years experience in Washed Clays

Write for article "An American Coating Clay"

THE MINER-EDGAR CO.

110 WILLIAM ST. NEW YORK, N. Y.

Market Quotations

Quoted by Hepburn & Co., 74 Broadway, N. Y. City, to whom all inquiry for quotations on these or any other Securities is referred.

BONDS	BID	OFFERED
Advance Bag & Paper, 7s 1943	101	103*
A. P. W. Pulp & Power, 7s 1945	101	102
American Writing Paper, 6s 1947	79	82
Bastrap Pulp & Paper, 6½s 1940	100	101
British Columbia Pulp & Paper, 6s 1950	85	90*
Beaver Products Corp., 7½s 1942	106	109
Berkshire Hills Paper, 8s 1941	60	80
Brown Paper Co., 1st 5½s 1946	94	98
Bryant Paper Co., 6s 1942	100½	102
Cape Breton Pulp & Paper, 6s 1932	101	103
Central Paper Serial 6, 6½s 1942	89	...
Champion Coated Paper, 6s 1926 to 1932	98	...
Champion Fibre, 8s 1930	100	...
Champion Paper Corp'n, 1st 6s 1945	94	97
Continental Paper Products, 6½s 1943	88	91½
Cornell Wood Prod., 7½s 1937	100	104*
Crown Willamette Paper, 6s 1951	97	101
Donnaconna Paper, 6s 1940	100½	102
Dells Paper & Pulp Serial, 6s 1926-38	*95	...
Eastern Mfg. Co., 7s 1938	90	93
Eddy Paper, 7½s 1931	102	104
Escanaba Paper Serial, 6s 1926-39	93	95
Fiber Fibre Serial, 7s 1926-39	95	...
Fort Orange Paper, 7s 1942	95	100*
Fox River Paper, 7s 1931	99	...
Gair Co. (The Robt.), 7s 1937	104	106
Gilbert Paper Co., 6½s 1926-29	89	...
Hammermill Paper, 6s 1939	100	103*
Hoberg Paper & Fibre, 7s 1937	94½	96
Itaska Paper & Prairie River Power, J+5½s 1926-38	94	96*
Itaska Paper 1st, 6s 1933-38	96	98*
Kalamazoo Veg. Parchment, 6s 1938	98	...
Marinette & Menominee, 7½s 1936	101	...
Mead Pulp & Paper, 5% Notes, 1927-37	90	95
Menasha Printing & Carton., 6½s 1939	99½	...
Mengel Company, 7s 1926 to 1934	100*	102
Monroe Paper Products, 7½s 1932	96	...
Munising Paper, 6s 1927-36	96	100
Nekoosa Edwards, 1st Ref. 6s 1928 to 1942	96	99*
Orono Pulp & Paper, 6s 1943	98	...
Orono Pulp & Paper, 5s 1941	94	...
Oswego Falls Corp., 6s 1941	98	100*
Oxford Paper, 6s 1947	100	...
Paepcke Paper Mills, 7s 1930	99	None
Parsons Pulp & Lumber, 7s 1928	97	...
Parker Young Co., 6½s 1944	95	99
Paterson Parchment Paper, 6s 1938	100½	102
Penobscot Chemical Fibre, 6s 1942	98	...
Poland Paper, 7s 1930	98	...
Port Alfred Pulp, 6½s 1943	*96	...
Queens City Paper, 7s 1932	95	100*
Richardson Co., 6s 1938	100	...
Spanish River Pulp & Paper, 8s 1941	106	110
Stevens & Thompson Paper, 6s 1942	91	94
St. Anne Paper, 6½s 1946	95½	98*
St. Croix Paper, 5s 1926-37	95	98*
St. Regis Paper Serial, 6½s 1926-35	98½	...
Tait Paper & Color Industries, 6s 1934	85	93
Taggart Bros. Co., 6s 1944	96	97
Ticonderoga Pulp & Paper, 5s 1930	95	98
Ticonderoga Pulp & Paper, 6s 1940	98½	100*
Warren (The S. D.) Company, 6s 1945	98	101
Wotab Paper, 6½s 1943	102	...
Westfield River Paper, 7s 1926-43	Wanted	...
Whitaker Paper, 7s 1942	106	108
Witmer-Parsons Pulp & Lbr. (Units)	63	70

STOCKS	BID	ASKED
Advance Bag & Paper, 8% Pfd.	97	100*
Am. Tissue Mills, 7% Pfd.	95	100
British Columbia P. & P., Pfd.	65	70
Brompton Pulp & Paper, 8% Pfd.	93	98*
Brown Corpn., 7% Pfd.	97	100*
Champion Fibre, 7% Pfd.	99	103*
Diem & Wing, 7% Cum. Pfd.	87	...
Donnaconna Paper, Com.	58	...
Donnaconna Paper, Pfd.	95	100
Eastern Mfg. Co., 1st Pfd.	34	37
Great Northern Paper (new)	60	70
Hammermill Paper, 7% Pfd.	105	110
Hinde & Dauch, Com.	135	...
Hinde & Dauch, Pfd.	100	...
Holyoke Card & Paper	150	None
Marathon Paper Mills, Com.	125	...
Midwest Box Co., Pfd. 8%	80	85
Midwest Box Co., Pfd. 6%	55	65
Louis De Jonge Co., 7% Pfd.	93	96
Oxford Papers, Com.	102	...
Oxford Paper Co., Pfd.	100	105
Penobscot Chemical Fibre, Com.	65	75*
Richardson Co., 7% Pfd.	104	...
Rubberoid Company	73	77
Seaman Container, Class B (par $1)	1	None Off.
Seaman Paper Co.	Wanted	None Off.
St. Croix Paper	150	170
St. Regis Paper Co., 7% Cum. Pfd.	97	100
Westfield River Paper Co., 1st Pfd.	Wanted	None Off.
West Virginia Pulp and Paper, Com.	58	63
West Virginia Pulp and Paper, Pfd.	97	102
Whittaker Paper, 7% Cum. Pfd.	97	103

*Nominal

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@45.00
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine Sized	8.00	@11.00
News—		
Rolls, contract	3.25	@ —
Rolls, transient	3.25	@ 3.50
Sheets	3.65	@ 3.85
Side Runs	3.00	@ 3.75
Book, Cased—		
S. & S. C.	6.35	@ 7.75
M. F.	6.25	@ 7.75
Coated and Enamel	8.00	@15.00
Lithograph	8.00	@15.00
Tissues—Per Ream—		
White No. 1	.80	@ 1.00
Anti-Tarnish	1.10	@ 1.90
Colored	1.00	@ 2.00
White No. 2	.75	@ .85
Kraft	.90	@ 1.00
Manila	.75	@ .85
Kraft—		
No. 1 Domestic	6.25	@ 6.50
No. 2 Domestic	5.25	@ 5.50
Southern	4.75	@ 5.25
Imported	6.50	@ 7.00
Manila—		
No. 1 Jute	9.00	@ 9.25
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.75	@ 5.25
No. 2 Wood	4.00	@ 4.50
Butchers	3.75	@ 4.25
Fibre Papers—		
No. 1 Fibre	5.00	@ 5.50
No. 2 Fibre	4.75	@ 5.25
Common Bogus	2.75	@ 3.00
Screenings	3.00	@ 3.25
Card Middles	4.00	@ 5.00
(Delivered New York)		
Glassine—		
Bleached, basis 25 lbs.	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00
Boards—per ton—		
News	47.50	@50.00
Straw	53.50	@57.50
Chip	45.00	@47.50
Binders' Boards	70.00	@75.00
Sgl. Mla. Ll. Chip.	57.50	@60.00
Wood Pulp	80.00	@85.00
Container	65.00	@70.00

Mechanical Pulp

(Ex-Dock)

No. 1 Imported—		
Moist	32.00	@34.00
Dry	34.00	@36.00
(F. o. b. Mill)		
No. 1 Domestic	27.00	@30.00
Screenings	15.00	@20.00

Chemical Pulp

(Ex-Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	3.50	@ 4.50
Easy Bleaching	3.05	@ 3.25
No. 1 strong unbleached	2.60	@ 2.85
Mitscherlich unbleached	2.75	@ 3.40
No. 2 strong unbleached	2.50	@ 2.70
No. 1 Kraft	2.70	@ 2.90
Sulphate—		
Bleached	3.75	@ 4.00
(F. o. b. Pulp Mill)		
Sulphite (Domestic)—		
Bleached	3.40	@ 4.75
Easy Bleaching Sulphite	2.85	@ 3.05
News Sulphite	2.50	@ 2.70
Mitscherlich	3.25	@ 3.75
Kraft (Domestic)	2.70	@ 3.40
Soda Bleached	3.50	@ 3.75
Sulphate Screenings—		
Coarse	.75	@ .85
Refined	1.50	@ 1.85

Domestic Rags

New Rags

Prices to Mill f. o. b. N. Y.

Shirt Cuttings—		
New White, No. 1	11.75	@12.25
New White, No. 2	8.00	@ 8.50
Silesias No. 1	7.25	@ 7.75
New Unbleached	10.75	@11.25
Washables	4.25	@ 4.75
Fancy	5.50	@ 6.00
Blue Overall	7.25	@ 7.75
New Blue Prints	5.25	@ 5.50
New Soft Blacks	5.25	@ 5.75
Mixed Khaki Cuttings	4.50	@ 5.25
Pink Corset Cuttings	9.50	@10.00
O. D. Khaki Cuttings	5.25	@ 5.75
Men's Corduroy	3.75	@ 4.25
New Mixed Blacks	3.50	@ 3.75
Old Rags		
White, No. 1—		
Repacked	5.75	@ 6.50
Miscellaneous	4.75	@ 5.25
White, No. 2—		
Repacked	3.25	@ 3.75
Miscellaneous	2.75	@ 3.00
St. Soiled, White	2.50	@ 2.75
Thirds and Blues—		
Repacked	2.25	@ 2.50
Miscellaneous	1.75	@ 2.00
Black Stockings	3.25	@ 3.75
Roofing Rags—		
Cloth Strippings	1.65	@ 1.75
No. 1	1.65	@ 1.75
No. 2	1.35	@ 1.45
No. 3	1.25	@ 1.35
No. 4	1.25	@ 1.35
No. 5A	.95	@ 1.05

Foreign Rags

New Light Silesias	7.00	@ 7.50
Light Flannelettes	7.75	@ 8.50
Unbleached Cottons	10.00	@11.00
New White Cuttings	10.50	@11.50
New Light Oxfords	7.00	@ 7.50
New Light Prints	5.50	@ 6.50
New Mixed Cuttings	3.00	@ 3.50
New Dark Cuttings	2.75	@ 3.25
No. 1 White Linens	7.00	@ 7.75
No. 2 White Linens	5.25	@ 6.00
No. 3 White Linens	4.00	@ 4.50
No. 4 White Linens	3.00	@ 3.50
Old Extra Light Prints	2.75	@ 3.25
Ord. Light Prints	2.25	@ 2.50
Med Light Prints	1.85	@ 2.10
Dutch Blue Cottons	2.25	@ 2.50
German Blue Linens	2.50	@ 2.75
German Blue Cottons	2.00	@ 2.25
Checks and Blues	1.75	@ 2.00
Lindsay Garments	1.75	@ 1.85
Dark Cottons	1.60	@ 1.65
Shoppery	1.50	@ 1.60
French Blues	2.25	@ 2.50

Old Rope and Bagging

Prices to Mill f. o. b. N. Y.

Gunny No. 1—		
Foreign	1.80	@ 1.90
Domestic	1.90	@ 2.00
Wool Tares, light	1.60	@ 1.70
Wool Tares, heavy	1.65	@ 1.75
Bright Bagging	1.60	@ 1.70
Small Mixed Rope	1.50	@ 1.65
Manila Rope—		
Foreign	3.75	@ 4.00
New Burlap Cut	3.00	@ 3.25
Hessian Jute Threads—		
Foreign	3.50	@ 4.00
Domestic	3.25	@ 3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, White, No. 1	3.40	@ 3.60
Hard, White, No. 2	3.00	@ 3.15
Soft, White, No. 1	2.80	@ 3.00
Flat Stock—		
Stitchless	1.25	@ 1.35
Overissue Mag.	1.25	@ 1.35
Solid Flat Book	1.15	@ 1.25
Crumpled No. 1	.80	@ .90
Solid Book Ledger	1.90	@ 2.10
Ledger Stock	1.40	@ 1.50
New B. B. Chips	.45	@ .55
Manilas—		
New Env. Cut	2.40	@ 2.60
New Cuttings	1.60	@ 1.85
Extra No. 1 old	1.25	@ 1.35
Print	.65	@ .75
Container Board	.50	@ .55
Bogus Wrapper	.70	@ .80
Old Kraft Machine Compressed bales	2.00	@ 2.10
News—		
No. 1 White News	1.50	@ 1.60
Strictly Overissrue	.65	@ .75
Strictly Folded	.47½	@ .52½
No. 1 Mixed Paper	.37½	@ .42
Common Paper	.25	@ —

FIDALGO
(Pulp)
DRYING SYSTEM

Producing a compact air dry bale (suitable rail and water shipment 40 - 45 cu. ft. per ton) of *shredded* pulp.

Higher test than when dryed on cylinder machine.

33 1/3% Saving at Beater

WRAPPED EXPORT BALE

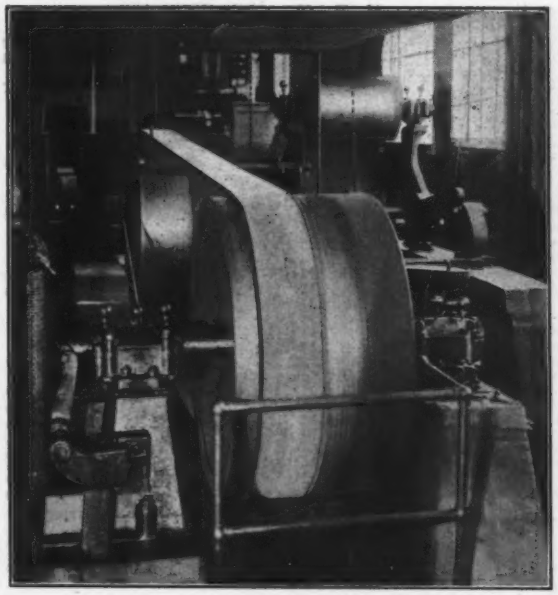
Write for full particulars and low operating costs.

Technical Economist Corporation

40 RECTOR ST, NEW YORK, N. Y.

Telephone Whitehall 5243 Cable Herenco

RHOADS TANNATE BELTING



A Report On Belt Costs

Here are the principal facts of a recent report on a Rhoads Tannate Leather Belt furnished a Wisconsin paper company in April, 1923.

DATA:—Heavy double; 40 feet long; one ply 12-inches the other 10-inches; the wide ply next the pulleys. It is the cone drive of a paper machine 176-inches wide, with capacity of 60 tons daily. Distance between centers 13 feet. Belt speed 3400 F. P. M.

HISTORY:—Belt in constant use for four years, and on April 15, 1927 was still running in fair condition. It may last for months yet. It has been taken up only twice; the last time was about a year ago. The price paid was $324.72.

Rubber Belts Cost More

Previous to the Tannate two rubber belts were used on this drive; a 12-inch 8-ply next the pulleys and a 10-inch 6-ply on top of this. On an average this pair of belts cost $182. One of these belts had to be replaced about every three months; making a belt-cost of $182 every six months.

Note This Further Saving

The Tannate has been running four years, an 8 to 1 record. Had they continued using rubber the cost would have been $1456 for the four years; against the Tannate cost of $325—a Tannate saving of $1131 on purchase cost alone. The rubber gave much truble with hooks tearing out, with frequent takeups on account of stretch, plus the cost of putting on the seven pairs of belts. We may, therefore, safely figure five hours working time lost per year. At $50 per hour, a very safe estimate, this gives us an added loss of $1000 due to the rubber belts. Their mechanical engineer says that the above figures for shut-downs are, if anything, too low.

It pays to use Rhoads Tannate Leather Belting.

J. E. RHOADS & SONS

PHILADELPHIA.....37 North Sixth Street
NEW YORK.....104 Beekman Street
CHICAGO.....324 West Randolph Street
ATLANTA.....70 South Forsyth Street
CLEVELAND.....1224 W. Ninth Street

Factory and Tannery: Wilmington, Del.

Twines

F. o. b. Mill

Cotton—			
No. 1	.28	@	.29
No. 2	.26	@	.27
No. 3	.24	@	.25
B. C., 18 basis	.38	@	.40
A. B. Italian, 18 basis	.48	@	.53
Finished Jute—			
Dark 18 basis	.24	@	.25
Light 18 basis	.27	@	.28
Jute Wrapping, 3-6 Ply—			
No. 1	.21	@	.23
No. 2	.20	@	.22
Tube Rope—			
4-ply and larger	.18	@	.19
Fine Tube Yarn—			
5-ply and larger	.23	@	.27
4-ply	.24	@	.28
3-ply	.26	@	.30
Unfinished India—			
Basis	.16	@	.17
Paper Makers Twine			
Balls	.13	@	.15
Box Twine, 2-3 ply	.17	@	.19
Jute Rope	.21	@	.23
Ameri. Hemp, 6	.29	@	.31
Sisal Hay Rope—			
No. 1 Basis	.18	@	.20
No. 2 Basis	.16	@	.18
Sisal Lath Yarn—			
No. 1	.16	@	.18
No. 2	.14	@	.16
Manila Rope	.24	@	.26

CHICAGO

All Rag Bond	.35	@	.41
No. 1 Rag Bond	.25	@	.35
No. 2 Rag Bond	.14	@	.25
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¼	@	.11
Superfine writing	.18	@	.24
No. 1 fine writing	.14	@	.18
No. 2 fine writing	.12	@	.14
No. 3 fine writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
News—Roll, mill	.03½	@	.04¼
News—Sheets, mill	.03¾	@	.04¾
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¾
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	.05¾	@	.06¼
Southern Kraft	.04½	@	.05
No. 2 Kraft	.05	@	.05¼
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue—			
24x36 Sheet	.07	@	.07¼
White Tissue—			
20x30 sheet	.07¼	@	.07½
Boards, per ton—			
(Delivered Central Territory—			
Plain Chip	45.00	@	47.50
Solid News	47.50	@	—
Manila Line Chip	55.00	@	57.50
Container Lined—			
(Delivered Central Territory)—			
85 Test	65.00	@	70.00
100 Test	70.00	@	75.00

Old Papers

F. o. b. Chicago

Shavings—			
No. 1 Hard White	3.60	@	3.70
White Env. Cuttings	3.60	@	3.70
No. 1 Soft Shavings	2.90	@	3.00
No. 1 Mixed	1.35	@	1.45
No. 2 Mixed	1.05	@	1.10
Ledger & Writings	1.45	@	1.60
Solid Books	1.20	@	1.30
Blanks	1.65	@	1.75
Kraffs	1.80	@	1.90
New Kraft Cuts	2.25	@	2.35
Manila Envelope Cuttings	2.00	@	2.10
Ex. No. 1 Manila	1.55	@	1.65
Print Manila	.80	@	.90
Folded News (overissue)	.65	@	.75
Old Newspapers—			
No. 1	.55	@	.60
No. 2	.50	@	.55
Mixed Papers—			
No. 1	.55	@	.60
Roofing Stocks—			
F. o. b. Chicago, net cash			
No. 1	30.00	@	—
No. 2	28.00	@	—

BOSTON

Paper

F. o. b. Mill

Ledgers—			
Sulphite	.07½	@	.15
Rag content	.15	@	.30
All rag	.38	@	.52½
Bonds—			
Sulphite	06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.07	@	.20
Superfines	.11	@	.31
News	.03½	@	.04
Book, Super	.06	@	.09
Book, M. F.	.05¾	@	.08½
Book, Coated	.08½	@	.20
Coated Litho	.09	@	.12
Label	09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03½	@	.04½
No. 1 Kraft	.05¾	@	.06½
No. 2 Kraft	.05	@	.05¾
Common Bogus	.02¼	@	.02½
Delivered New England points			
Straw Board, rolls	.009		57.50
Straw Board in Sheets, basis 35s to 70s			53.50
Filled News Board			47.50
Chip Board			45.00
Single Manila Pulp lined board	55.00	@	60.00
Single White, patent coated board bender	75.00	@	80.00
Wood Pulp Board	80.00	@	85.00
Binder Boards	70.00	@	75.00
(F. o. b. Mills)			
Tarred Felts—			
Regular, carload lots	65.00	@	—

Old Papers

F. o. b. Boston

Shavings—			
No. 1 Hard White	3.25	@	3.75
White Blank News	1.40	@	1.50
Manila Env. Cuttings	2.00	@	2.25
No. 2 Hard White	3.00	@	3.25
No. 1 Soft White	.03	@	.03¼
No. 1 Soft White	2.75	@	3.00
No. 1 Mixed	1.10	@	1.15
No. 2 Mixed	.85	@	.90
Solid Ledger Stock	2.25	@	—
No. 1 Books, Heavy	1.10	@	1.20
No. 1 Books, Light	—	@	1.15
No. 1 New Manila	2.25	@	2.50
No. 1 Old Manila	1.40	@	1.60
Print Manila	.70	@	.80
Old Kraft	1.65	@	1.80
Overissue News	.55	@	.60
Old Newspapers	.45	@	.50
No. 1 Mixed Paper	.47½	@	.52½
Box Board, Chip	.45	@	.60

Bagging

Price f. o. b. Boston

Gunny No. 1—			
Foreign	1.50	@	1.60
Domestic	1.50	@	1.60
Manila Rope—			
Foreign	3.50	@	3.75
Domestic	4.00	@	4.37½
Mixed Rope	1.05	@	1.15
Scrap burlaps	1.35	@	—
Wool Tares, heavy	1.40	@	1.60
Mixed Strings	.90	@	1.05
New Burlap Cutting	2.15	@	2.25

Domestic Rags (New)

Price f. o. b. Boston

Shirt Cuttings—			
New White No. 1	.11¼	@	.11½
Silesias, No. 1	.07	@	.07½
New Unbleached	.10	@	.10½
Fancy	.05¾	@	.06
Washable	.04½	@	—
Cottons—According to Grades—Blue—			
Blue Overalls	—	@	.07
New Black, soft	.04	@	.04¼
Khaki Cuttings	.05	@	.05½
Corduroy	.03	@	.03½
New Canvas	.09	@	.10

Domestic Rags (Old)

Price f. o. b. Boston

White No. 1—			
Repacked	5.00	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Thirds and Blues—			
Repacked	2.12½	@	2.37½
Miscellaneous	1.75	@	1.90
Roofing Stock—			
No. 1	1.37½	@	—
No. 2	1.25	@	—
No. 3	1.12½	@	—
No. 4	1.00	@	—

PHILADELPHIA

Paper

F. o. b. Mill

Bonds	.07	@	.40
Ledgers	.11	@	.40
Writings—			
Superfine	13	@	.18
Extra fine	—	@	.22
Fine	.20	@	.26½
Fine, No. 2	16	@	.25
Fine, No. 3	.12	@	.20
Book, M. F.	.06¾	@	.07
Book, S. S. & C.	.06	@	.07½
Book, Coated	.11	@	.16
Coated Lithograph	.09	@	.12
Label	.09	@	.12
News	.03¾	@	.04
No. 1 Jute Manila	.09½	@	—
Manila Sul., No. 1	.04½	@	.06
Manila, No. 2	.04	@	.04½
No. 2 Kraft	.05	@	.05¼
No. 1 Kraft	.06	@	.06¾
Common Bogus	.02¾	@	—
Straw Board	60.00	@	65.00
News Board	45.00	@	50.00
Chip Board	40.00	@	42.00
Wood Pulp Board	4.50	@	5.00
(Carload Lots)			
Binder Boards—			
No. 1, per ton	85.00	@	90.00
No. 2, per ton	70.00	@	75.00
Carload lots	60.00	@	65.00
Tarred Felts—			
Regular	66.00	@	58.00
Slaters	70.00	@	72.00
Best Tarred, 1-ply (per roll)	1.85	@	1.95
Best Tarred, 2-ply (per roll)	1.55	@	1.70
Best Tarred, 3-ply	2.10	@	2.15
No. 1 Mixed Paper	.65	@	.70

Domestic Rags (New)

Price to Mill, f. o. b. Phila.

Shirt Cuttings—			
New White, No. 1	.11½	@	.12
New White, No. 2	.07	@	.07½
Light Silesias	.07	@	.07½
Silesias, No. 1	.07½	@	.08
Black Silesia, soft	.05	@	.05½
New Unbleached	.10½	@	.11
Washable	.04	@	.04½
Fancy	.05½	@	.06
Cottons—according to grades—			
Blue Overall	.07½	@	.08
New Blue	.03½	@	.04
New Black Soft	.05½	@	.06
New Light Seconds	.03	@	.03½
Khaki Cuttings	.04½	@	.05
Corduroy	.03	@	.03¾
New Canvas	.08	@	.09
New Black Mixed	.05	@	.05½

Bagging

F. o. b. Phila

Gunny, No. 1—			
Foreign	1.75	@	2.00
Domestic	1.75	@	2.00
Manila Rope	4.25	@	4.50
Sisal Rope	1.25	@	2.00
Mixed Rope	1.25	@	1.50
Scrap Burlaps	1.75	@	2.00
Wool Tares, heavy	2.00	@	2.25
Mixed Strings	1.50	@	1.75
No. 1, New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.25	@	2.50

Old Papers

F. o. b. Phila.

Shavings—			
No. 1 Hard White	3.50	@	3.60
No. 2 Hard White	3.00	@	3.25
No. 1 Soft White	2.80	@	2.90
No. 2 Soft White	1.90	@	2.00
No. 1 Mixed	1.50	@	1.60
No. 2 Mixed	.90	@	1.00
Solid Ledger Stock	1.90	@	2.00
Writing Paper	1.65	@	1.75
No. 1 Books, heavy	1.15	@	1.20
No. 2 Books, light	.80	@	.85
No. 1 New Manila	2.40	@	2.50
No. 1 Old Manila	1.50	@	1.60
Print Manila	1.00	@	1.10
Container Manila	.75	@	.80
Old Kraft	2.00	@	2.20
Common Paper	.40	@	.50
No. 1 Mixed Paper	.50	@	.60
Straw Board, Chip	.60	@	.65
Binders Board, Chip	.60	@	.65
Overissue News	.75	@	.80
Old Newspaper	.50	@	.60

Domestic Rags (Old)

White, No. 1—			
Repacked	5.00	@	5.25
Miscellaneous	4.75	@	5.00
White, No. 2—			
Repacked	.03½	@	.04
Miscellaneous	.02	@	.02¼
Thirds and Blues—			
Repacked	2.50	@	2.75
Miscellaneous	1.75	@	2.00
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	1.55	@	1.65
No. 2	1.40	@	1.50
No. 3	1.25	@	1.35
No. 4	1.20	@	1.30
No. 5A	.90	@	1.00
B	.80	@	.90
C	.80	@	.90

TORONTO

Paper

F. o. b. Mill

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.10¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.11¼	@	—
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
News f. o. b. Mills—			
Rolls (Carloads)	3.25	@	—
Sheet (carload)	3.75	@	—
Sheets (2 tons or over)	4.00	@	—
Book—			
No. 1 M. F. (carLoads)	7.75	@	—
No. 2 M. F. (carloads)	7.50	@	—
No. 3 M. F. (carloads)	7.25	@	—
No. 1 S. C. (carloads)	8.25	@	—
No. 2 S. C. (carloads)	8.00	@	—
No. 3 S. C. (carloads)	7.75	@	—
No. 1 Coated and litho	14.50	@	—
No. 2 Coated and litho	13.50	@	—
No. 3 Coated and litho	12.75	@	—
Coated tinted	.15	@	—
Wrapping—			
Rag Brown	4.85	@	—
White Rag	5.25	@	—
"B" Manila	5.65	@	—
No. 1 Manila	6.65	@	—
Fiber	6.65	@	—
Kraft, M. F.	7.20	@	—
M. G.	7.35	@	—

Pulp

(F. o. b. Mill)

Ground wood	30.00	@	31.00
Sulphite easy bleaching	60.00	@	65.00
Sulphite news grade	55.00	@	60.00
Sulphite, bleached	78.00	@	80.00
Sulphate	65.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	3.50	@	—
Soft White Book Shavings	3.00	@	—
White Blk, News	1.40	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.25	@	—
Light and Crumpled Book Stock	1.10	@	—
Ledgers and Writings	1.40	@	—
Solid Ledgers	1.40	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	1.00	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.80	@	—
Strictly Folded	.47½	@	.52½
No. 1 Mixed Paper	.37½	@	.42

Domestic Rags

(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.12	@	.12½
Fancy Shirt Cuttings	.06	@	.06¼